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INCORPORATING

MEDICINE AND THE MEDICAL AGE

A Monthly Journal of Practical Therapeutics

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ORIGINAL COMMUNICATIONS.

HISTORICAL STATEMENT OF THE INSTITUTION OF THE COLD FRESH AIR TREATMENT OF PNEUMONIA.

BY W. P. NORTHRUP, M.D.,

Physician to the Presbyterian Hospital, New York.

It is difficult to say at what date the treatment of pneumonia in the open air was "instituted"—about 1900 perhaps. In 1904 the report shows that the Presbyterian Hospital had recognized the value of open air and had begun an open-air ward for the systematic treatment of pneumonia and fever patients out-of-doors. A few ultra-enthusiasts, no doubt, long ago treated fever patients and possibly pneumonia in the open air, and even before the tuberculosis treatment was established. It remained for some one to place the open-air treatment of pneumonia on a safe basis. In short, it required the backing of a hospital responsibility to insure its adoption.

Sixteen years ago the pneumonia jacket was losing favor, the poultice was used sparingly; drugs were having it all their own way. Pneumonia was treated, not the patient. Little was said about the feeding of the case and nothing about the air it breathed. The heart was the main organ to be watched lest it fail. A failing heart called for more alcohol and strychnine, and digitalis was king. In this connection it is interesting to note that in later years there has been animated discussion as to whether most of the digitalis of the stores was inert, and whether there is little or no value in strychnine. The treatment of pneumonia was academic—one treated the pneumonia.

Not pleased with the padded rooms and oiled silk jackets, restless, muttering patients swathed and sweating in a "mousing" atmosphere, I gradually backed from the treatment and drew the patient nearer to the open window and the open air. It was not a sudden inspiration, but a slowly growing conviction that the best care of the patient, the best stimulus to the heart required cold, drifting fresh air and lots of it. When I published my first case a doctor in the audience came forward and said, "You treated my child that way eleven years ago." I had forgotten the date; time goes quickly.

It is probably the experience of all that one's nearest associates are the hardest to convince. It was the young hospital staff that first came in intimate touch with the cases and were the first converted. The following case gave perhaps the first start to the rolling ball. In making the rounds, beginning on the right-hand side as usual, I heard a groaning from behind a screen on the extreme left, corner bed. On inquiry I learned that a severe case of pneumonia had come in during the night and was so desperately bad that he had been accorded the privilege of a corner bed and the kindly screen, in order that the poor fellow might have all the privileges possible in a public ward, while he passed away to join his fathers. We cut across to the bed that would be last in our rounds to investigate the case. Here was the traditional treatment of pneumonia, in full activity; every attention had been given the patient, and all kinds of hypodermics were lying unabsorbed beneath his epidermal covering. The air about him was that of a large, well-ventilated ward. He was blue, puffing eighty to the minute, groaning, apparently comatose—hopeless. A complete description of

his general appearance would make a classic dying scene.

In twenty minutes a convalescent patient in a small outside room had exchanged places with this man. The huge window was pushed far up, the bed's head was dragged as near as possible to it, and cold fresh air was dropping on the face of our dusky man, late of the corner bed. What was the result? The patient still breathed eighty to the minute, but his face became less dusky, his eyes opened, his nose involuntarily reached up to the incoming air, and an expression came into his face not before seen. Doctors were amazed—nurses horrified. When anything was to be done the nurses involuntarily started to close the windows. Then the unusual happened. The patient waved them away. He was too busy gasping to waste breath on words, but eagerly motioned the window up and them away from the space. The most difficult thing to do was to keep the nurses from closing the window. Almost unconsciously on the least exposure the window was closed. At last the idea entered their minds that cool fresh air was all-important.

On my next visit to the hospital I heard rumors of a patient being killed by cold air, in ward seven. The place was full of rumor. The next day the story was changed, and it said a patient was being cured by cold air. The actual result was that the patient began to improve at once and ultimately fully recovered. The temperature was very high, the respiration eighty per minute, etc. This case impressed the young men, and they made a note that cold fresh air does not always kill pneumonia patients. By such striking cases the practice hitched along until it became the routine treatment. The greatest final impetus was given to the adoption of the practice by the results of the following striking case. The account from the *Medical Record* illustrates the prejudices to be overcome and the need for cautious proceeding. I may further add that all went easy thereafter.

The history of the case was as follows: Female, fourteen months. It had had rickets and scurvy, could not make the first effort at walking. Its legs hung down like empty stockings. It had a well-marked rickety rosary and prominent abdomen. Its general appearance, however, was that of a "pot-bellied," feeble, perspiring child, with much curly hair; in coloring, in the fairness of skin, with delicate touches of rose in the lips and occasionally in the cheeks, in darkness of eyes and hair, it was a beautiful child. Even one less near to it than fond young parents, doting grandparents, and loving aunts, of which it had a full quota, could not help feeling a strong attraction.

The diagnosis was bronchopneumonia. Pulse, 180-140; respiration, 60-40; temperature, 105°, delirium. One would not call this a mild case.

I told the parents that the one thing which would help the anemic little one to bear her poison, eliminate it, redden her blood, and sustain her heart, was cool, flowing fresh air, day and night. I said the child had a sore lung, a limping respiration, diminished breathing room, that to air its blood it had to pant, and panting was hard for the heart. To be kind to the patient, we must give her oxygen-full air, not second-hand breaths. She must not be made to breathe five times where three would do.

"The child," I said, "could not catch cold from air touching her face. The dry skin of a fever patient was not susceptible to cold. A fever patient in bed was quite safe. Cool, fresh air reddens the blood, stimulates the heart, quiets restlessness, favors sleep, improves secretions and digestion; in short, meets most of the indications for treatment of pneumonia in infants."

The largest room practicable in the house was selected, the crib was placed near the middle wall opposite the two windows and two doors; one window and one or two doors were constantly open. The month was December, and the weather was exceptionally cold. The windows were open night and day, and one night the thermometer in the room reached 28° F. In compassion for the nurses the friends of the family produced two automobile fur coats, which they wore night and day.

The little patient was fired to an internal

heat of 105°. Her pretty little face was bathed by cool, flowing air, and she slept. If, by reason of necessary exposure, the windows and doors were closed temporarily, she showed restlessness, which disappeared when the windows were again opened.

There were two tendencies of the case—one to become flatulent and distended, the other to have cold feet. Each time either condition prevailed the face became dusky, restlessness was marked, and at times there was delirium. For these two conditions the sovereign remedies were the foot-bath and high hot saline injections. For heart stimulant, a hot foot-bath; for flatulence, a hot, high saline injection; for restlessness, either or both of these. These two afforded relief, followed by three hours of sleep. In giving the foot-baths, the child was elevated on a firm pillow, and the feet were let down into a basin under the bed covers; hot water was added a little at a time, with constant friction of the feet. The action of these two derivatives, hot foot-baths and hot high salines, was enough to remove all untoward symptoms.

The case ran a course of twelve days, recovery taking place by crisis. The best is yet to be mentioned. The digestion in this case had given great trouble. At the onset of the pneumonia there was diarrhea with green mucous stools. The toxins of pneumonia disturbed the digestion still further, and the tendency to flatulent distention was marked. It was a constant problem to find anything which would be digested. But as soon as the crisis had passed and the fever was gone, the child simply opened her eyes, smiled, and began to digest her food as though nothing had happened. She was a trifle pale and rather weak, but a less damaged baby I have never seen. Here is a striking illustration of the peculiar feature that the disturbance of intestinal digestion ceases with the ending of high fever.

The nurses said that they endured their vigils much better, were fresher and wider awake from having constant good air. They declared that my prognosis was fully justified, and believed that the patient passed through with less exhaustion than any other they had ever known.

This point I wish to reiterate: This feeble child passed through her serious infectious disease with less injury to her general nervous system than any other I have known.

If any one thinks the institution of such a radical change in the treatment of this terrible disease, such overturning of tradition, was not revolutionary, I submit the following as an example of what frequently occurred in daily experience:

Casual meeting and conversation. Scene in street-car; strap-hanging. Enter car friend of the family: eager expression. "How's that child?" This doctor friend of the family I had not seen in six months, but somehow I seemed to know whom he meant by "that child." "How's that child: has it really pneumonia? I won't believe what I hear until you tell me yourself that it is pneumonia. Are you treating it in a cold room with all the windows open in the month of December?" I plead guilty. He added, after a long look, "Well, all I've got to say is, if anything goes wrong with that case, I pity you." He added that their social position and their host of friends—well, you know what was in his mind.

One evening, in a pneumonia season, I alighted at a Westchester station, and from the doctor's carriage entered a well-lighted house—surprised to find a host of friends, suggestive of an evening party. What I found was more than hinted at in the following prescription:

How to Kill a Baby with Pneumonia.—Crib in far corner of room with canopy over it. Steam kettle; gas stove (leaky tubing); room at 80° F. Many gas-jets burning. Friends in the room, also the pug dog. Chest tightly enveloped in waistcoat poultice. If child's temperature is 105° F., make a poultice thick, hot, and tight. Blanket the windows, shut the doors. If these do not do it, give coal-tar antipyretics and wait.

The doctor at once instituted the most approved open-air treatment and adopted the regular practice thereafter. That means, of course, that the treatment was satisfactory in its results.

At the present time there are multitudes of hospitals having open sheds, and some having fully equipped open-air wards, the Presbyterian and Mt. Sinai hospitals being, as far as I know, the first two to build complete open-air wards.

In Philadelphia the Jefferson Medical College Hospital has two such wards.

DIAGNOSIS, COMPLICATIONS, AND TREATMENT OF PNEUMONIA IN CHILDREN.[1]

BY H. BROOKER MILLS, M.D.,
Clinical Professor of Pediatrics in the Medical Department of Temple University; Pediatrist to the Samaritan, Garrettson, and American Stomach Hospitals.

Pneumonia in children occurs either in the form of bronchopneumonia, frequently called catarrhal, or lobar pneumonia; and of the two forms broncho is, of course, by far the more prevalent. Various ages have been suggested under which the attack is likely to be bronchopneumonia and after which it is more likely to be lobar, and these ages vary all the way from two to five years, but personally I feel, particularly in view of experience during the present epidemic, that even five years is too low. A very good reason for this is that bronchopneumonia, being practically always secondary, follows, among other diseases, the acute infections of childhood, which are most common during the early school years. That bronchopneumonia may occur as a primary affection cannot be denied, although it is evidently very rare, the highest estimate with which I am familiar being five per cent of the cases. In making a diagnosis, therefore, of bronchopneumonia, one always has three important points to start with, viz.: the age of the patient, the history of a previous illness, and the existing bronchitis. Adding to these three points three other symptoms which rarely fail to be present, viz., increased pulse, increased respiration rate, and fever, a provisional diagnosis can usually with safety be made, particularly if there be at the same time dilatation of the alæ nasi and definitely localized mucous râles. The physical signs rapidly develop and are many and varied, no two cases really being alike. For this reason it has been stated that the presence of physical signs should not be necessary to make a diagnosis of bronchopneumonia (Kerley). However, among other physical signs that may be present in addition to the localized mucous râles already mentioned is the fine, crepitant râle which is often heard over the consolidated area, but where the pneumonic process is widely distributed there will be an equally wide distribution and variety of râles, the sibilant and fine, moist mucous predominating. In certain areas the respiratory murmur may be scarcely discernible.

The breath sounds seem exaggerated, which is often largely due to the very thin chest walls in children. Bronchial breathing and bronchophony may also be present. On percussion one may obtain some idea of the degree and the extent of the lung involvement, its sounds varying all the way from normal to complete dulness. The temperature range is very irregular, some days being from 101° to 102°, and other days being from 103° to 104°. The pulse rate is usually between 140 and 160, and the respiration rate about 40. The latter, however, is frequently increased by an overdistended colon pushing up the diaphragm, particularly if the preceding illness had been of a gastrointestinal character. Both lungs are usually involved. The disease is not self-limiting, and will therefore frequently run for two or three weeks, finally terminating by lysis.

As to the complications of bronchopneumonia, the most common is otitis media. Emphysema is always present, and, in a small proportion of cases, pericarditis, meningitis, arthritis, and nephritis occur. Pleurisy also occurs fairly frequently. Empyema is comparatively rare as a complication of bronchopneumonia, being much more common after lobar.

The prognosis is always grave and the mortality is high, being estimated by some authors as fifty per cent. While the age and previous condition of the patient have some effect on the mortality, the height and character of the temperature during the attack is in no sense a guide in prognosis.

The treatment of bronchopneumonia is largely symptomatic, with special attention to the preservation of the patient's strength

[1]Read before the Philadelphia County Medical Society, January 26, 1916.

and upbuilding of his vitality, which is necessarily low when one considers the age of the patient and the fact that the pneumonia is following some other illness, which has probably seriously diminished his powers of resistance. A temperature of 65°, with plenty of fresh and frequently changed air, in the room, and a maximum amount of liquid nourishing diet to the point of digestive tolerance, are necessary, and a daily colonic irrigation, daily bath, and plenty of water are indispensable. Counter-irritation is often of considerable value, one of the best methods being the hot mustard application, which consists of adding a teaspoonful of mustard to a pint of hot water and applying to the chest a flannel soaked in this preparation, using it for twenty minutes at a time, three or four times a day. Dry-cupping and the application of hot camphorated oil are also of value. In view of the fact that otitis media is such a common and frequently serious complication, a frequent and thorough cleansing of the nose and throat is absolutely necessary. A cleaning out of the gastrointestinal tract at the beginning of the attack is also important, particularly if the pneumonia is secondary to some gastrointestinal trouble.

For the cough, inhalations are preferable to expectorant mixtures, so that the stomach may be saved for nourishment only, and the compound tincture of benzoin has given me good service. For the high temperature I have been in the habit of using hydrotherapy exclusively, and have been much pleased with the results obtained. Such young children stand the depressing effects of antipyretics very badly, especially in their weakened condition, and the hydrotherapeutic treatment seems to produce the desired effect without the drawbacks of drugs. Whenever the temperature is above 100°, an ice-bag is placed to the head and a hot-water bottle to the feet, the ice-bag being removed at the end of an hour and replaced at the end of another hour, and so on. Should the temperature reach 102°, a tepid sponge is given, using either plain water or water to which alcohol has been added. If the temperature continues to rise and reaches 104°, a colonic irrigation is given. Should the tepid sponge and colonic irrigations fail to control the temperature, the child is sponged with water at three different temperatures successively—first at 90°, then at 80°, and then at 70°, if necessary still further reducing the temperature to 60° or even 50°. The water used in the colonics may also be reduced to the same degree. In addition to these methods, much benefit has been derived from wrapping the hands and arms to the elbows and the feet and legs to the knees in wet cloths, covering them with a dry cloth and keeping them on for twenty minutes three or four times a day, the principle being the same as that of counter-irritation, viz., bleeding the child into its own vessels. These various methods are used on a four-hour basis during the day, and I have rarely found it necessary to use any other treatment for the high temperature where I have been able to get the hydrotherapeutic properly carried out. Believing that plenty of rest and sleep are essential to recovery, my pneumonia patients are never disturbed for any treatments after 7 P.M., but should they be awake advantage is taken of this fact to meet the indications then present.

As to stimulation, I feel this is frequently resorted to too early in the disease, the result being that the stomach is upset, and the artificial stimulation the child gets from the drugs is not to be compared to the natural stimulation to be derived from plenty of good, nourishing food well digested, which he probably would have been able to take had the digestive apparatus not been disarranged. When the heart needs assistance, it should surely be given, as would be the case if a very rapid pulse existed, or a soft, irregular pulse, in which case the tincture of strophanthus is the remedy of choice, using for a child under two years one or two drops in water every three hours. Another good remedy when the heart action is irregular and the pulse is soft and compressible is strychnine, in from 1/200 to 1/150 of a grain dose every three hours. In urgent cases these two remedies may be used together. Digitalis and alcohol

should rarely be resorted to in these cases. Should the child become markedly cyanosed, with cold extremities, nitroglycerin in 1/300-grain doses may be used, but should be stopped as soon as these symptoms disappear.

In my hospital cases I have been fortunate in being able to have them on a well-lighted and well-protected porch leading off from the ward, and the results have been most satisfactory.

I suppose I should at least make a reference to the bacterin treatment of pneumonia, of which, however, I have made but little use, owing to the great variability of the reports of those who have used it extensively and the equally great uncertainty of the dosage and the reaction in a weak, debilitated child. I do not feel that any case in which I have used the bacterin treatment with recovery would not have recovered without it, nor do I feel that any case which terminated fatally could have been saved by its use in the present state of bacterin therapy. Fifty million bacteria seems to be about the average initial dose, to be repeated according to the results obtained.

As to lobar pneumonia, I only wish to call attention to the symptoms of the onset as we see them in children in comparison with the adult. Lobar pneumonia is ushered in by high temperature oftener than any other disease of childhood, except scarlet fever. The onset is sudden, with high temperature, rapid respiration, vomiting, prostration, and abdominal pain. This pain, which is usually centered around the umbilicus, is believed to be due to diaphragmatic pleurisy. For the first twenty-four hours of an attack of lobar pneumonia there are neither pulmonary symptoms nor physical signs in the chest of the existence of a pulmonary condition. The chill which is usually present in the adult is rare in children, rigor seeming to take the place of the chill. Another important point in the onset of lobar pneumonia in children is that there is practically no cough or expectoration for the first two or three days in the majority of cases, and the differential diagnosis, therefore, of lobar pneumonia in children is rather between that and some abdominal condition than some other chest condition, at least for the first twenty-four hours. The one point which, from the moment of onset, despite the preponderance of abdominal symptoms, will stamp the case as a pulmonary condition, is the greatly increased respiratory rate. The disease usually attacks robust children in apparent good health; is self-limited; is characterized throughout the attack by a sustained temperature instead of the irregular temperature of bronchopneumonia, and terminates by crisis. Empyema is a frequent complication, and an important point to bear in mind is that there is no relation between the amount of fluid present and the amount of lung involved.

To refer for a moment to the present epidemic of pneumonia in Philadelphia, there are several points which, in my experience, are out of the ordinary, and explanations of which do not seem to be forthcoming. In the first place, there has been a large number of cases of lobar pneumonia occurring in children below the age when we expect to find it—that is to say, two years—and these cases have frequently been in weak, debilitated children instead of in the robust child as is usual. Then, too, there seems to be a greater tendency than usual for the diseased areas occurring in cases of bronchopneumonia to coalesce. In addition, I have been surprised at the number of cases of bronchopneumonia in which the temperature has been sustained throughout the attack, very similar to lobar, instead of being the irregular and moderate temperature which we usually have in broncho. One remarkable fact has struck me very forcibly in several cases of bronchopneumonia during the present epidemic, and that is the enormous excursions of temperature that have occurred in several cases between the hours of 7 P.M. and 7 A.M. Patients whose temperature would be from 103° to 105° during the day would rise to 106° or drop to 96°, or both, during the same night, and yet the child would not seem to be any

the worse for passing through this experience.

When it comes to advancing any reasons for these various peculiarities of the present epidemic, I am really at a loss to offer any satisfactory ones. It has been suggested that the suddenness of the development of the grippe epidemic this fall may have had something to do with it, and also the unusually warm weather that preceded and by spells has followed the grippe's arrival. It has occurred to me that probably the virulence of the epidemic itself may have had something to do with producing these unusual conditions. A number of my cases, however, did not follow grippe so far as could be learned. One might be disposed to view them as lobar, but if there is anything in the age, history of a previous illness, clinical symptoms, and physical signs, they were undoubtedly broncho. The only complication I have had was meningitis in a couple of cases, and these I had reason to believe were due to the lighting up of a latent tuberculosis, which was verified by lumbar puncture.

THE DIAGNOSIS AND TREATMENT OF PNEUMONIA.[1]

BY HOBART AMORY HARE, M.D.,
Professor of Therapeutics and Diagnosis in the Jefferson Medical College of Philadelphia; Physician to the Jefferson Hospital.

Before taking up a consideration of pneumonia it is essential to define what we mean by this term. Consolidation of any part of the lung, whether it be due to the pneumococcus, the tubercle bacillus, or other cause, is in one sense pneumonia. In this paper, however, I shall not consider catarrhal, lobular, or bronchial pneumonia, because it has been covered by Dr. Mills, but croupous or lobar pneumonia in which there is hepatization of one or more lobes of the lung. The longer I practice the more I am convinced that both of these conditions are, in a great number of cases, terminal infections —that is, they strike down those who for the moment, or chronically, are suffering from some other disease or alcoholism. Bronchial pneumonia is a complicating lesion during the course of convalescence of many acute diseases, particularly in the case of children, and it also develops in the aged, who often are chronic sufferers from bronchial lesions and feebleness of the right heart. Croupous pneumonia strikes rarely on the child, often on the adult, and very often at the aged. Indeed, it may be said to be nature's method by which she removes from the list of the living those who have had their span of years. When I use the term "aged" I do not refer to those rich in years, for many men at forty or fifty are as old as others seventy or eighty.

In this communication I shall quote largely from my paper in Musser and Kelly's Treatment, because what I said in that book represents my views to-day. In that article I said "croupous or lobar pneumonia, the common manifestation of pneumococcic infection, is an acute infectious disease characterized anatomically by bacteremia and toxemia and a *local* inflammation in the lung progressing to consolidation. The designation pneumococcic infection is preferable to croupous or lobar pneumonia, chiefly for the reason that the inflammatory lesions in the lung may be the smallest part of the process going on in the body, and because the extent of the lung involvement has not much to do with the severity of the illness of the patient. It is important to bear in mind that the local lesions in the lung are accountable for some, but not for all, of the patient's symptoms; that the patient ill with croupous pneumonia is suffering from a general infection with the pneumococcus; that organs other than the lungs may harbor morbid lesions at least as well marked as the local pulmonary lesions; that in some cases these other lesions are susceptible of clinical recogni-

[1]Read before the Philadelphia County Medical Society, January 26, 1916.

tion; and that the severity of the clinical manifestations in a given case depends upon the virulence of the infecting pneumococcus and the resistance offered by the patient. The extent of the local lesions, be they in the lung or elsewhere, bears no necessary relation to the severity of the general symptoms, which, on the contrary, are an expression of the toxemia."

If every case of croupous pneumonia is to the physician merely an instance of consolidation of the lung, followed by death or resolution at the end of a week or ten days, then he will almost certainly fall into one of two errors. If his cases get well on a certain plan of treatment he will congratulate himself on his skill, and if a goodly proportion die he will suffer, according to his temperament, from more or less chagrin and doubt as to his therapeutic acumen. As a result he may fail to adhere to a plan which is based on sound sense, and he may turn to one less logical and not founded on experience. Whereas, if he recognizes the fact that in some of his cases the existing conditions are such that no plan of treatment can succeed, or at best can only do so by the most careful nursing, he will obtain a perspective or broad view of the course of the disease and the results of the treatment which will make clear the need of modification to suit the individual without impairing the general plan he has found to be the best. The physician in the latter case is like the mariner who, having worked out his course, finds it necessary to make minor changes because of wind and wave; whereas the physician who fails to gain a clear conception of the whole state of his patient, in each instance is so harassed by head winds and unexpected seas that he may find himself buffeted by conflicting factors to such an extent that he is soon sailing an uncharted sea without the compass of experience or the sextant of observation. It is largely because of these facts that so many plans of treatment of infections in general, and pneumonia in particular, are advanced. Each man in the face of a calamity has a plan of his own for escape, and some succeed by the aid of, or in spite of, nature, while others fail. It is by no means rare at a medical meeting to hear the treatment of croupous pneumonia discussed with minute detail as to drug and dose and no detail as to the age, state, general health, and vital resistance of the patient. The statement of drug and dose is useful, but it is of little real value unless we are told that the age of the patient was favorable or unfavorable, and unless we know, for example, that the kidneys and vascular system were or were not diseased, and that the patient was not addicted to alcohol.

It is important to remember that the physical signs, the actual lesions, and the course of the disease in both types of pneumonia, and particularly of the croupous type, are widely variant according to the state of the victim and the virulence of the invading organisms. Although from the etiological standpoint every case of pneumonia is identical, from the clinical standpoint one case is often as different from another as smallpox is from chicken-pox, for in one case the coccus is a cat, in another a tiger. These points are of value in discussing the diagnosis and treatment.

In all cases of true lobar pneumonia we are to bear in mind the fact that the patient is suffering from an acute, infectious disease which is quite as specific as is scarlet or typhoid fever, or diphtheria, and in the absence of a specific antitoxin we must recall the fact that we are not to attempt to treat the disease, or, for that matter, to attempt to treat the patient, with drugs, except when some definite assistance is demanded. Of this I shall speak later.

Concerning the diagnosis of both forms of pneumonia it is not necessary for me to reiterate the characteristic physical signs found in the text-books. The point I want to make is that the absence of these positive physical signs as a group often misleads the physician. Suspecting pneumonia he listens for fine râles or bronchial breathing. Not finding them he excludes pneumonia, when, as a matter of fact, these signs are absent because the exudate is too great for them

to occur. In other words, he should listen for silence as much as for sounds. In such cases percussion will often reveal dulness over a silent area, but even percussion may mislead one because a deep-seated consolidation may give hyper-resonance on light percussion over the area affected. Again, we may overlook a lesion if we do not auscult the axillary area, particularly if we do not uncover the lung by raising the scapula by placing the hand over the head with the elbow well abducted. In cases of cardiac disease the possibility of an infarct producing bloody sputum and physical signs must be recalled and unilateral pleural effusion must be excluded. The differentiation of effusion and pneumonia is easy in typical cases, and still easier in the text-books, but it is often one of the most difficult problems to solve in practice, every aid and sign being developed before the diagnosis is possible. Often the *x*-rays are the deciding factor.

In children I have noticed that a lesion at the apex is often associated with a fear of falling, so that the child clutches the mother as if it were about to drop off her lap.

Fever is, of course, of great diagnostic value, but in the old or feeble and in renal cases it may be very slight, and even absent in cases which are rapidly fatal. This holds true also in diabetes. The patient's resistive forces are absent. Like fever the white blood-cell count may prove misleading. A high leucocytosis is most suggestive, but a very slight increase in white cells may be present in the victim of age or disease or in those who are hard hit. So, too, the initial chill may vary from an intense rigor to a slight feeling of creepiness, and in the latter case a chill does not appear in the history. The point to emphasize is that croupous pneumonia may assault a man frankly, or attack him as insidiously as a sapper does his enemy in warfare.

The sputum may also vary greatly. In some cases it is glutinous and clear, in others glutinous and bloody, in others thin and bloody, as in cases of edema, and in still others it is very dark, like prune juice. In both the latter types it is ominous. It is well in this condition to recall the words of Sir William Jenner, "the brighter the blood, the less the weight, the better the prognosis." To which may be added, the higher the fever, the slower the pulse, the better the prognosis. And, again, I think it may be said that a large area of pulmonary involvement with bright sputum is better than a small, deep-seated lesion, so-called "core pneumonia," with little sputum. The only cases of hemoglobinuria in croupous pneumonia I have ever seen were met with in patients with a deeply seated small lesion.

As to the treatment of croupous pneumonia, I do not think I am guilty of excessive language when I say, "For God's sake let them get well." Do no harm. Let nature's laboratory make the needed drugs. Do not make the patient strive to be a victor over disease and medicine. No one can see the treatment of many of these cases, and, if they get well, fail to exclaim after seeing the number of drugs used, "What a wonderful constitution the patient has." The point is not to try to treat the pneumonia.

Dean Swift saw a child stroke the back of a tortoise, and was told it was done to please the tortoise. He replied, "You might as well stroke the dome of St. Paul's cathedral in an endeavor to please the dean and chapter." This story may be applied to the use of those remnants of barbarism, cotton jackets and poultices. How any one can see a hepatized lung and then think that a poultice on the chest is going to do anything else than harm the patient I cannot understand. There is not a man in this room who could tolerate a hot poultice all around his chest as long as it takes me to read this paper. There would be a demand for more air because the poultice oppressed him, although he has two good lungs and a healthy heart. If a hepatized lung is the local lesion resulting from a general infection, why should we poultice the chest in pneumonia any more than we would paint the abdomen with nitrate of silver to treat the intestinal ulcers in typhoid fever.

There are certain remedies in this disease which, although they have been frequently employed, are without doubt contraindicated in all instances. I refer to the coal-tar antipyretics. There is a large amount of evidence that fever is a protective process, or is indissolubly connected with the protective processes. It often is a most valuable sign-board in directing us as to what we shall do for the patient, and the physician who wipes out fever in the pneumonic patient by the use of antipyretic drugs is like the man who knocks down the sign-board on the road he travels. Fever is not harmful, and antipyretics are useless. Except in cases of distinct hyperpyrexia, where the temperature remains above 105° for a long period, even cold sponging is, as a rule, to be avoided, for the patient will not react. On the other hand, there is an agent which tends to lower temperature and permit oxidation which, I believe, is as near a specific remedy as any that we have, namely, cold, fresh air. When William Perry Northrup of New York instituted this method of treating pneumonia a great advance in our method of dealing with this disease came about. No matter how carefully a room is ventilated, the mere heating of the air of the room to an ordinary living temperature seems to devitalize it to the pneumonia patient, and cold, fresh air diminishes the lividity and cyanosis with remarkable speed if there is enough lung left to carry on oxidation. I have frequently seen a patient, brought in from the pneumonia roof ward in excellent condition, become distinctly livid and markedly worse within ten or fifteen minutes, and equally rapidly improve when once more put in the fresh air. I would rather have this method of treating croupous pneumonia than any drug with which I am familiar. It is hard on the nurses, but it is life to the patient.

Another mistake which is frequently made is to treat symptoms without any good reason for treating them, simply because the symptoms are not in accord with the normal state. Any attempt to force the pulse, the respiration, or the temperature to the normal line is futile and dangerous. It is just as natural for variations to occur in these functions in disease as it is for a ship to go up and down in a storm, and the landsman who attempts to make the ship rest on an even keel in a storm by opening her seacocks and flooding her hold with water is not more insane than the doctor who tries to make nature fit into his way of thinking. Some persons when treating pneumonic patients seem to be like a Filipino suffering from the running amok, who shoots with everything he can lay his hands on at everything in sight.

It must not be thought from what I have said that in the treatment of pneumonia I am a therapeutic nihilist, or an advocate of "peace at any price." On the contrary, when any symptom, or series of symptoms, becomes so widely separated from normal function as to be dangerous in itself, or to indicate the approach of danger, it should be curbed and curbed fearlessly. The function of the physician is to determine with nicety these facts. If one drug in a given dose is useful in all cases the patient needs a druggist, not a doctor.

Time does not permit me to go into an intimate discussion of the exact conditions which indicate different remedies. I can only say that, as the result of a pretty large experience, I believe the administration of 10 drops of tincture of belladonna three to four times in the course of each twenty-four hours throughout the greater and particularly during the latter part of an attack of croupous pneumonia tends to prevent complications in the vascular apparatus, and that atropine and strychnine are to be kept in reserve to be used in full dose to meet any threatening of collapse. Alcohol in the form of a good whisky is often exceedingly valuable in those of advanced years and in those who have been accustomed to its use. In certain cases in which there is great cyanosis in plethoric individuals, free venesection is sometimes advantageous. If heart-clot is the cause of the cyanosis, of course it can do no good, but if the right ventricle is distended it may afford necessary relief.

So, too, if there is grave toxemia, it is questionable as to whether venesection will do good.

There are other points to which I would like to address attention. Gibson of Edinburgh and myself have written a number of papers pointing out that any approximation of the systolic pressure in millimeters of mercury with the number of beats per minute of the heart is indicative of approaching danger. I believe this is true in adults, although not an invariable rule. It is of no value in children. More important is it to estimate the difference between the diastolic and systolic pressure: thus, if the diastolic pressure is low, it is evident that remedies which will raise blood-pressure or influence the blood-vessels directly, or indirectly, are indicated, particularly if the systolic pressure is high, indicating that the heart muscle is strong. Thus a diastolic pressure of 60 with a systolic pressure of 150 shows that there is relaxed vascular tone, but a powerful heart stroke, and cardiac stimulants are not needed; whereas a diastolic pressure of 70 and a systolic pressure of 110 may indicate in certain cases that both vascular and cardiac stimulation is essential.

The second point which I wish to emphasize is the error of writing prescriptions for a pneumonia patient and having them continued for days at a stretch. With the possible exception of belladonna, which is used to prevent vascular complications from suddenly arising, I have never seen any case of pneumonia which needed the same remedy, in the same dose, day after day. The skilled physician will fit his drug and his dose to the needs of his patient at each visit, for, like a captain of a ship, he cannot control the storm but only handle his vessel. The captain of a ship who leaves the bridge with written orders to the helmsman at 10 o'clock in the morning and does not appear on deck again for twenty-four hours is courting disaster. The doctor who tells a nurse to use full doses of active remedies every few hours for the next twenty-four hours or for days is almost equally courting disaster. If the man needs stimulation he needs it actively in one or two doses. He rarely needs it again and again and again, unless he is in such a desperate state that the physician should stand by him to reach an accurate estimation of his condition from hour to hour. In other words, when a small boy is trying to climb a tree, boost him when he needs to be boosted, get under him if he slips so dangerously that he seems about to fall, but don't shove him so hard and so constantly that he pitches over on his head and cracks his skull. He badly needs help occasionally, but not all the time. A few good-sized doses of digitalis are often wise, but its persistent use is usually unwise.

I quote again from my paper in Musser and Kelly's Treatment:

"The proposition as to the circulation is not 'it must be stimulated,' but rather 'does it really need stimulation?' and if so, how much is needful? In order to determine what is really needed the physician must find if the first sound of the heart possesses its normal tone and if the apex-beat is normally forcible and in the proper place, and he must allow for the presence of the fever and illness as a natural cause of perversion of function, and not as a manifestation that the heart is seriously impaired. He must listen with care at the third left costal cartilage to discover if accentuation of the pulmonary second sound indicates an abnormally high pressure in the pulmonary artery, threatening failure of the right heart, and he must listen to the aortic sound to discover if the fever, or other cause, has produced such a state of arterial pressure that the left ventricle is called upon to do too much labor. Finally, his fingers upon the pulse and the use of the sphygmomanometer must give him additional information as to arterial tension, pulse force, and pulse rhythm. If the results of all these tests is the discovery that nothing evil exists, let the medical attendant carefully eschew the use of drugs. If, on the other hand, he finds that the first sound of the heart lacks quality, he is called upon to use a stimulant, and he must determine which is most needed. The need of a stimulant becomes still more emphatic if the secondary pul-

monary sound is accentuated and if the pulse is arrhythmic or if it misses beats. The choice of the drug depends in part upon the age of the patient, his general vitality, and, very important, the stage of the illness and the duration of the evil symptoms. In the aged, if the arterial tension is not too high, digitalis is often useful, giving it often in small, divided doses to avoid irritating the stomach; or, in its place, one of the alcoholic stimulants is often needful. The latter are absolutely essential if there is a history of the free use of this form of stimulation before the illness. These remedies may be needed in elderly patients, but they are less and less necessary as youthfulness exists, and it is often the case that the skilful physician can, by the use of some rapidly acting diffusible stimulant, give such support to the circulation that he may bridge over a temporary distress and get his patient into 'smooth water on the other side of the reef,' where he may progress without any further use of drugs unless he gets in some acute difficulty a second time."

Digitalis acts too slowly in many urgent cases to do any good while aid is needed. In a great emergency strophanthin may be given intravenously, or the American preparation strophanthone may be used intravenously or hypodermically. It is an efficient cardiac stimulant. There is surely no more reprehensible practice than the ordering of large quantities of medicine to be taken day after day in pneumonia as a matter of routine.

Morphine will often save life when prolonged sleeplessness or constant tossing threatens to exhaust the patient.

"I have, on a number of occasions, called attention to what I believe is the very general abuse of strychnine as a circulatory stimulant. It is, without doubt, the custom of a large number of practitioners to rely upon strychnine as a stimulant to the heart during the course of the acute infectious diseases, and not only to give it for a few days at a time, but to continue its administration day by day and even week by week, with the result that the patient may be benefited during the earlier part of its administration, but soon fails to develop any good effects from its use, and, on the contrary, suffers from a condition of circulatory and nervous irritability which is often taken for a manifestation of the disease. There can be no doubt that full or even massive doses of strychnine are exceedingly valuable in their effects in cases of acute circulatory failure, and even in many cases of subacute circulatory failure such doses may not only improve the patient's condition, but actually save life, it being the consensus of opinion among medical men that massive doses of strychnine are very certainly life-savers when cardiac failure is threatened.

"Much misunderstanding of the proper use of nitroglycerin exists. I have repeatedly pointed out that the very common employment of nitroglycerin by the profession as a circulatory stimulant is based upon an erroneous conception of its physiologic action, and when good results have followed its administration in cases of cardiac failure, which are not due to high arterial tension, the physician has given credit to the nitroglycerin, when, in reality, the credit should be given to the recuperative powers of the patient. It is not conceivable that nitroglycerin can be of benefit by lowering the arterial tension of a patient whose blood-vessels are naturally elastic and whose blood-pressure is practically normal or below normal, yet, as I write this article, I read the opinion of a well-known specialist in diseases of children, who advises the use of nitroglycerin in infants who may be suffering from circulatory embarrassment due to pneumonia. It is quite true that in some of these cases when the skin is hot and dry and the administration of a drug which will relax it and produce mild diaphoresis is followed by good results, but the good effects which follow this plan of treatment are due to the equalization of the circulation in various portions of the body, and do not depend upon any stimulant effect upon the circulatory or nervous system. Sweet spirit of nitre, which has a physiological action closely allied to nitroglycerin, is sometimes a better remedy than the more powerful

drug, nitroglycerin, if any vascular relaxant is needed."*

Expectorants in either type of pneumonia are never useful until the stage of resolution is well developed, if then. They cannot do good and they upset the stomach. There is nothing to spit up. Resolution takes place by the development of autolytic substances, and we cannot hurry it.

I wish to sound a note of warning against the use of iodides in cases of delayed resolution. The processes of nature are best suited to the removal of the exudate in the vesicles of the lung. The iodides may hurry these unduly, and may in the general process cause an absorption of some old inflammatory mass which has walled off and rendered innocuous an old tuberculous deposit. In cases in which delayed resolution is present, and the physician is tempted to hurry it by the use of the iodide, he too often finds that the delay is not due to the remains of a frank pneumonia, but is the result of a terminal or coincident infection by other organisms, and the officious interference of the physician when nature is endeavoring to produce good results may be followed by disaster. In many instances so-called delayed resolution is really an empyema or an interlobar empyema.

The problems in a given case are as follows:

1. Has the patient croupous pneumonia?
2. If so, what is his general state?
3. Are the heart, kidneys, and vessels primarily diseased?
4. Does he need any other treatment than rest in bed and good nursing?
5. If so, what does he, that individual, need?
6. Does he need stimulation, sedation, elimination?
7. If he needs stimulation does he require it right along, or only at the moment? When we eat we don't eat all the time for days, but only when we need food.
8. As to all drugs follow Cromwell's motto, "Trust in God, but keep your powder dry." Don't shoot all the time, but follow Warren's advice at Bunker Hill, "Hold your fire until it will be surely effective," and then use the remedies needed fearlessly, and all the more advantageously because they have not been used before.

AURAL COMPLICATIONS OF INFLUENZA.[1]

BY S. MacCUEN SMITH, M.D.,
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Influenza has been recognized and treated as such for ages, the epidemics having always been characterized by intervening periods during which the disease seems to have been banished from the face of the earth. There have been periods of such complete cessation of this disease that many physicians of the past knew nothing of its nature from clinical experience. From the time of the notable epidemic of 1888, which in an incredibly brief time became pandemic, spreading over the entire civilized world, we have not only learned much as to its true nature, but have come to look upon the advent of epidemic influenza with serious apprehension, not so much, perhaps, from the fact that influenza, *per se*, seriously endangers life, but chiefly from the knowledge of the grave complications and numerous deaths that invariably result from local complications. It is with one of these complications, as manifested in the organ of hearing, that this paper chiefly treats.

With possibly one exception, we are at present unable to draw a clinical picture characteristic of the changes in the upper air-passages chargeable directly to the specific action of the bacillus of influenza. There can be no doubt, however, that the inflammatory changes are distinguished for their intensity, rapidity, and virulence of action, frequently involving the tympanic and adjacent cavities in a serious suppurative process quite unusual in any other

* Musser and Kelly's "Treatment."

[1]Read before the Northern Medical Association of Philadelphia, January 28, 1916.

infectious disease. The exception above referred to is that known as hemorrhagic otitis, which is by many believed to be *the* distinguishing feature of otitic influenza. Although this hemorrhagic tendency may not be wholly diagnostic of the severe inflammatory ravages involving the mucous membrane generally, still there can be no doubt that hemorrhage does occur from the membrana tympani, tympanic cavity, throat and lower respiratory tract, as well as from the gastrointestinal, genito-urinary, and possibly other internal organs.

I feel that the gravity of this disease, in its broadest sense, is not yet wholly comprehended by the medical profession. This statement finds its justification when we realize that more human lives have been lost in one influenza epidemic than were sacrificed in many of the former great wars of the world, or the plagues of ancient days.

The initial observable inflammatory process in otitic influenza is a severe myringitis, hemorrhagic in character, with the formation of bluish-red extravasations, at times coalescing and forming large, dark-colored bullæ, which, as Politzer has pointed out, usually collapse and discharge a bloody, serous fluid before rupture of the membrana tympani occurs. Areas of ecchymosis are also seen on the walls of the external canal. Maceration and consequent peeling off of the mucous lining of the tympanum is much more rapid and extensive than when caused by other virulent disease.

Mastoid implication or irritation is present in all *severe* cases, the percentage of patients requiring operative interference being unusually large. In a few of these the mastoid becomes involved simultaneously with the middle ear.

In attacks of acute otitis media resulting from the more ordinary causes, the pain is alleviated when the confined fluid is given free escape. In a goodly number of cases of influenza otitis, however, the suffering frequently continues for a day or two, with little or no abatement. This is especially marked when spontaneous rupture has occurred in place of a timely free incision of the overdistended membrana tympani.

Another group of cases is characterized principally by the absence of actual suffering, together with early spontaneous rupture of the membrana tympani. These cases are particularly interesting from the fact that, even in the absence of the usual symptoms, the mastoid and other adjacent structures are frequently involved. This latter class of cases emphasizes the need of expert care in order to prevent, if possible, the development of meningitis and other complications which are not suspected until grave symptoms of their actual presence become manifest, and which are, unfortunately, so common in children.

In addition to the special predilection for mastoid complication, meningitis, and lateral sinus thrombosis, intracranial and extradural abscess formations are encountered more frequently with each succeeding epidemic. The discharge, at first bloody, soon changes to that seen in ordinary cases of tympanic suppuration, with which all are familiar.

Demonstrating the presence of the bacillus of influenza is a matter of importance. However, within a short time the discharge from the tympanic cavity develops a mixed infection, such as the streptococcus, staphylococcus, pneumococcus, etc., thus often supplanting the original germs of infection. It is, nevertheless, of the greatest value to have a bacteriological examination of all discharges from the ear, as most useful information, even of vital import, is frequently disclosed. Curiously enough, during the recent epidemic, an examination of aural discharge seldom revealed the presence of the bacillus of influenza. The predominating organisms were the pneumococcus, streptococcus and staphylococcus, and, in some instances, where the discharge was taken directly from the mastoid process and had not been exposed to the air, a pure pneumococcic infection was revealed, this notwithstanding the fact that all of the cases had been treated by the attending physicians as typical attacks of epidemic influenza.

The method of infecting the middle ear and adjacent structures is either by direct continuity of structure, the organisms enter-

ing the tympanum through the Eustachian tube, or being conveyed by means of the blood-vessels and lymphatics; and you may be assured that with the same facility with which the bacilli of influenza find their way into the bronchi or deeper respiratory tract, producing a catarrhal or more serious complication; or into the gastrointestinal canal, with the attendant, and I might say characteristic, diarrhea; or into the nervous and circulatory systems, producing the train of serious neurotic phenomena familiar to us all; or into the genito-urinary tract, causing a functional or structural disturbance of more or less gravity—with even greater facility, I repeat, do these pathogenic bacteria invade the cavities of the skull, frequently destroying the function of a part, or even leading to a fatal issue.

The records of numerous cases furnished me by the attending physicians, nearly all of which cases I saw in consultation, teach an impressive lesson. I shall not burden you with details of these cases, but will merely point out a few general characteristics. About one-third of the number were distinctly hemorrhagic in type. In slightly more than one-half, the membrana tympani ruptured spontaneously within forty-two hours. The pain, mastoid symptoms, and fever, however, continued for from twenty-four to sixty hours after apparently free drainage had been established. In about one-fourth of the cases the membrane was freely incised before the point of spontaneous rupture was reached, and in each of these cases the pain was promptly relieved, as well as the temperature and all mastoid symptoms; while about two-thirds of those in whom spontaneous rupture occurred required operative intervention. In addition to mastoid empyema, meningitis developed in two patients before resort was had to operative interference.

As regards treatment, and especially prophylaxis, I have but little to add to that familiar to you all. However, I wish to lay particular emphasis on a few points. Aural complications, to be treated successfully, must be dealt with in a bold but not necessarily non-conservative manner from the very inception of the attack. Absolute rest in bed, with free diuresis and properly conducted diaphoresis, is of the first importance. The bowels should be freely opened and the diet restricted to milk and broth. Indeed, two or three days of absolute fasting and enforced rest in bed will frequently accomplish more in prophylaxis than any other combined therapeutic measures.

The first signs of aural involvement should receive prompt and energetic care. Influenza earache of the severe type will seldom yield to hot drops or applications, although, if seen at its inception, a hot boracic acid solution or a five- or ten-per-cent carbolic acid in glycerin solution instilled into the canal will do no harm and may be somewhat palliative. It should be remembered that the external layer of the membrana tympani is composed of modified skin, and is influenced but little, if any, by medicated solutions. Hot antiseptic solutions are most useful in many acute cases of otitis; hot medicated solutions are also useful, almost wholly, however, from the effect of the *heat,* and not from the medicaments they contain. Solutions of cocaine, belladonna and opium, etc., cannot be depended upon, therefore, for the relief of acute ear pain, except from the calorific action.

Bloodletting in front of the tragus is of service in most acute inflammatory diseases of the middle ear, but must be employed at the beginning of the attack to be beneficial. The ear should be frequently examined with a speculum and reflected light, to insure a prompt free incision of the membrane the moment any distention is seen. It is unwise to wait for a marked distention of the membrane in influenza otitis, as resolution seldom takes place in severe cases, whereas it is this delay that favors mastoid and intracranial complications. The more the distention, the greater the destruction to the soft parts and consequent involvement of the osseous structure. Under proper precautions an incision, and a free one at that, of the membrana tympani can do no possible harm, whereas a failure to promptly incise the membrane has been the one most prolific cause of serious complications. The

cause of conservatism is best served, therefore, by an early incision and complete evacuation of the fluid.

It must be kept in mind that the two essential elements for the rapid development and multiplication of bacteria are heat and moisture. The treatment of many cases, therefore, must be directed to meet or correct these elements, as the site of suppurative otitis media is a veritable hot-bed for the propagation of disease germs. Our chief object, then, in such cases is the application of therapeutic measures to rid the ear, as far as possible, of these bacteria, and endeavor to inhibit their further development by the destruction of the pabulum of their existence through the reduction of inflammatory heat and by keeping the propagatory surface dry.

If the discharge is profuse, irrigation or syringing with antiseptic solutions becomes necessary. One of the best for this purpose in influenza otitis is a 1:2000 permanganate of potassium solution. This can be alternated to advantage with a 1:6000 bichloride of mercury solution. Iodine in a one-percent solution is also serviceable. As the discharge lessens in quantity, syringing or irrigation should correspondingly decrease, and should be entirely suspended as soon as the decrease in discharge will permit; in other words, a continuation of syringing will frequently prolong a discharge, as explained in the preceding paragraph.

It is best, therefore, in those cases in which the discharge is not particularly copious, or in which it has markedly decreased under the wet method of treatment, to use the dry method of treatment, which consists in cleansing the canal with cotton on an applicator, and dusting the surface with impalpable boric acid powder or a powder composed of equal parts of boric acid and oxide of zinc. Aristol acts favorably in some cases.

In all severe acute suppurative diseases of the middle ear, the mastoid is more or less involved. In those complicating influenza, a much larger percentage develop into suppurative mastoiditis that requires operative intervention than from other causes. It is well, therefore, to keep in mind the fact that an otorrhea which is unduly prolonged has its origin in the mastoid cavity and is not prone to result in a spontaneous cure.

THE USE OF LUTEUM EXTRACT IN THE TREATMENT OF MENSTRUAL DISORDERS.

LEIGHTON, in the *American Journal of Obstetrics* for November, 1915, says he is certain that there are cases of dysmenorrhea in which the main causal factor is deficient action of the natural corpus luteum. He is not carried away with the idea that the therapy of corpus luteum is a "cure-all" in any sense of the word; on the other hand, the cases which may be traced to ovarian deficiency are probably in the distinct minority. One must not allow himself to be so impressed with the etiological value of some one factor in the cause of disease that he forgets, or becomes indifferent to, other factors of equal importance.

Surgery is necessarily indicated in those cases in which we find pelvic pathological conditions or anatomical abnormalities, which we are wont to consider as the probable causes of dysmenorrhea. Too often, however, do we resort to operation and, consequently, too often are we disappointed in the results, because the defect is not surgical but glandular. Again, more often than one would think, is organotherapy indicated in conjunction with surgical intervention.

There are some serious drawbacks to the use of corpus luteum. It generally has to be used routinely or continuously to obtain and to maintain results. Its cost hinders its more frequent administration. Its action is not immediate, it is cumulative; for that reason patients, and we ourselves, too often discard its use after a short trial, if it has been unproductive of good results.

As regards its dosage, the writer finds that from 15 to 20 grains a day, seldom more, is sufficient in any case. Its prolonged administration has not brought about any untoward symptoms in his cases, with, perhaps, the possible exception of slight gastric disturbance in one or two instances.

EDITORIAL.

GERM INFECTION AND VACCINE THERAPY.

We think that it may be stated without much danger of contradiction that so-called vaccine therapy has not proved as successful as it was thought it would be soon after it was introduced. After the enthusiasm born of its novelty had passed away it became increasingly evident that there were a number of factors which prevented it from being universally applied. One of these was the practical impossibility of determining the reactive power of the individual by measuring his opsonic index. Another difficulty has been to obtain a stock vaccine in which the strain of the pathogenic organism is identical with the strain which is infecting the patient, and, in acute illness, the time does not exist in which an autogenous vaccine can be made. Without doubt many cases which are treated by stock vaccines give advantageous results, but, oftentimes, in instances where the conditions are most urgent and where life is to be saved, rather than discomfort put aside, they entirely fail. Furthermore, the administration of any vaccine in too large a dose exercises a deleterious influence upon the patient, and the question as to what is too large a dose necessarily varies in each individual. Thus, a dose of a given organism which is perfectly proper in a case of furunculosis may be absolutely harmful to an individual whose vitality and reactive power is so impaired that he cannot respond to the treatment.

Three papers have appeared upon this subject very recently which seem to have an important bearing. One of them, by Rosenow, in the *Journal of the American Medical Association* of November 13, 1915, seems to prove very conclusively that organisms obtained from certain tissues possess the characteristics of having an affinity for similar tissues in other animals, or in human beings. Thus, he found that 14 strains of streptococci from a case of appendicitis produced lesions in the appendix of 68 per cent of the animals injected, whereas only 5 per cent of the animals injected with strains of streptococci obtained from other sources than cases of appendicitis suffered from a localization of the organisms in this part of the body. Similar results were obtained from streptococci taken from cases of cholecystitis, for they caused a similar lesion in 80 per cent of 41 animals injected, in contrast to an average of 11 per cent locally infected when injected with other strains obtained from parts of the body widely separated from the gall-bladder. These percentages practically hold good in regard to most, if not all, of the organisms which he obtained and studied. Thus, it is interesting to note that eight strains of streptococcus viridans, from chronic septic endocarditis, produced lesions in the endocardium of 88 per cent of the 44 animals injected, in contrast to an average of 15 per cent when the strains came from other lesions than those of the endocardium.

These experimental results of Rosenow, fortified by the researches of many others, are supported by a summarization of the literature presented by Hulst in the *Long Island Medical Journal* for November, 1915. Hulst in his paper shows, to use his words, that "bacteria are able to acquire new characteristics. In other words, some species at least are not stable, but change their metabolic processes to meet their environment. If variation occurs under the influence of weak chemical solution, salt concentration, oxygen tension, and symbiosis with other organisms, it is reasonable to presume that similar changes may occur in the body in the course of infections where environment is also variable to the parasite. Such phenomena have been observed; *e.g.*, the streptococcus obtained in puerperal sepsis may differ from that obtained from a metastatic abscess from the same case. Also cultures in pneumonia and otitis media suggest a transformation *in vivo* of streptococcus mucosus and of pneumococcus into hemolytic streptococcus.

"The selective action which organisms display toward certain tissues of the body may be acquired within the body to a certain extent. If there are alterations in the constitution of the parasite depending upon the conditions existing at the point of infection, this fact may determine the nature which the disease may assume as much as the parasite itself. Just what characteristics of bacteria control the affinities for various structures is not explained, but such affinities exist as well-marked phenomena, and bacteria undergoing experimental mutations show different affinities at different stages of their transformation."

In other words, it becomes evident from Rosenow's research, and Hulst's summary, that we not only have to deal with different strains of microörganisms belonging to the same family, but that we have to deal with alterations in pathogenic power induced by the conditions or peculiarities of the part in which the germ has grown, and this is possibly one of the reasons why autogenous vaccines have proved to be so much more efficacious than stock vaccines. It may also explain why so-called mixed vaccines have succeeded, for, although they have been generally condemned by bacteriologists, it is possible that when a mixed vaccine is used certain strains possessing the peculiarities of the organisms inducing the lesion in the patient may be efficacious while the associated strains are not.

Closely associated with this matter is the question as to the relative value of ordinary vaccines and sensitized vaccines, either as prophylactic or curative agents. It will be recalled that a sensitized vaccine is one in which the specific microörganism of an infection is brought in contact with the blood serum of an animal which has been infected by such an organism. In other words, the vaccine has been brought in contact with the antitoxin of this serum. If an ordinary vaccine is used it is necessary for the tissues of the body to provide the amboceptor by which the complement that already exists in the cells or juices can be linked to the bacteria. Therefore, when a so-called sensitized vaccine is employed this function of providing an amboceptor on the part of the tissues is avoided, and the vaccine which is injected can immediately proceed in developing the process of phagocytosis and, indirectly in some instances, aid in the development of antibodies.

In a research carried out by Schottstaedt (*Journal of the American Medical Association*, Nov. 13, 1915), the details of which it is not necessary to give here, in connection with typhoid infection, he studied the influence of non-sensitized vaccine killed by the addition of 0.6 per cent phenol; non-sensitized vaccine killed by 56° Centigrade; standardized 0.4 per cent killed by phenol; non-sensitized washed vaccine; and two types of sensitized vaccine.

He found that none of these products produced a negative phase in the opsonic activity. There was a slight reaction following the injection of non-sensitized vaccines, which was absent when sensitized vaccines were employed. Vaccines killed by heat seemed to be less active than those killed by phenol. He also found that the injection of these vaccines seemed to increase the opsonins more quickly than the agglutinins or the bacteriocidins, and that the opsonins and bacteriocidins are more persistent than the agglutinins, but he believes that the immunity is more likely due to the former than to the agglutinins.

By far the most important part of his observations, from the standpoint of the practicing physician, is his statement that sensitized vaccines are less potent than non-sensitized vaccines, which he thinks is due to the bacteria of the sensitized vaccines undergoing phagocytosis and bacteriolysis more rapidly. It would seem that this argument would work the other way, since the rapid destruction of the injected organisms, by setting free their toxic content, might be supposed to stimulate the protective processes.

Finally, Schottstaedt concludes that when it is the wish of the physician to confer a prolonged immunity, as in the prophylaxis against typhoid fever, it is better for him to employ non-sensitized vaccines, whereas in instances in which a quick response of the

protective powers is desired, as in typhoid fever which is already developed, sensitized vaccines are to be preferred.

COLLAPSE IN THE ACUTE INFECTIOUS DISEASES.

The sudden development of collapse in the course of the acute infectious diseases is a condition which is familiar to all practitioners of experience, and is universally dreaded because of its sudden onset and its grave danger. Against this onset many physicians attempt to guard their patients by the continual administration of stimulants and thereby overstimulate, calling upon the reserves of the body and expending them when they should be kept in reserve for critical periods.

It is interesting to note, as in so many other instances in medicine, that practical experience has developed the use of certain remedies to combat such collapse before the physiological or pathological processes responsible for it were understood. For many years physicians have been prone to use strychnine and, more than strychnine, atropine to combat this condition when it was threatened or present, and this long before it was recognized that atropine contracts the blood-vessels in the splanchnic area while tending to dilate the blood-vessels upon the peripheral portions of the body.

Two researches have appeared during the last two years which are interesting in this connection. One of them was made by Porter and Pratt, whose investigations seem to show that it is not the vasomotor center which is depressed by diphtheria toxin, thereby resulting in collapse through vascular relaxation. The other research is that of Meyers and Wallace, who found that the walls of the vessels themselves did not seriously suffer from the poison of diphtheria. They found that it seriously attacked the epithelium of the intestines, the capillaries in the liver, and that there is great congestion in the arteries in the abdominal organs, particularly an engorgement of the mesenteric vessels; in other words, great relaxation of the blood-vessels in the splanchnic area.

No one supposes for a moment that any drug is capable of restoring cells or tissues which have undergone actual destruction, and in such a case death may be inevitable; where, however, there is impairment of function it would seem that the use of atropine, to which we have referred as having been used empirically, has a scientific basis for its use.

VARIOUS METHODS OF TREATING PLEURAL EFFUSION.

It is indicative of the conservatism which governs medical men that most of them still resort to the vacuum bottle and aspirating apparatus in the treatment of pleural effusion. It is also illustrative of steadfast adherence to custom that in the belief of many every case of empyema should not only be opened and drained, but that it is essential that a piece of rib shall be excised. There can be little doubt that these two methods of practice are often correct, and the latter is doubtless the best plan to pursue in the majority of cases. Much depends, however, upon how long the empyema has been present, how closely the ribs are approximated, how old the patient is, and the cause, that is to say, the pathogenic organism, which has induced the trouble. Certainly in pneumococcus empyema occurring in children an incision between the ribs and the introduction of a double drainage-tube produces results which are quite adequate without the necessity of performing what is practically a major operation if the rib is to be excised under a general anesthetic; for the administration of a general anesthetic in the presence of a large effusion in the chest greatly increases the danger. The point is to see that drainage is adequate, and this can be aided by inserting the drainage-tube at a low point in the chest, by the maintenance of proper postures, and by gradual thoracic exercises in which the displacement of fluid from one Wolfe bottle to another is practiced several times a day. Where the effusion is in very large amounts we have

repeatedly expressed our belief that enough of it should be drained off by aspirating to permit the thoracic organs to gradually adjust themselves to the relieved pressure, since the sudden evacuation of a large effusion by means of the knife produces changes in the thoracic organs which are by no means devoid of danger.

When the fluid in the chest is not purulent we have come to the conclusion that the employment of the vacuum bottle is rarely needed. It is quite sufficient in many instances to attach a large-caliber needle to a piece of rubber tubing into the other end of which is fixed a funnel. Water, or a normal salt solution, is then poured into this funnel until all air is displaced from the tube. The needle then is introduced into the chest, and the funnel end of the tube, which has been held well above the patient's chest, now well filled with liquid, is lowered. The chest is by this means readily emptied by a process of siphonage and without the use of cumbersome apparatus. If the effusion is a transudate, all that is necessary to remove it is this means.

The most common cause of a transudate when on one side of the chest is probably cardiac disease, and, as is well known, the right side of the chest is the one upon which the effusion most frequently occurs. If the effusion be an exudate—that is, the result of an inflammatory process—it will be found that the fluid, when withdrawn by means of an aspirating syringe, used to determine positively that fluid is present, contains more albumin and has a specific gravity above 1018, whereas a transudate has a specific gravity often not greater than 1006. If a few drops of the fluid which has been withdrawn are dropped into a solution of glacial acetic acid of the strength of two drops to three and a half ounces of water, and a light, curling cloud of albumin follows the drops as they pass through the acidulated liquid, the fluid is an exudate. This does not take place when a transudate is added to the acetic acid solution.

It is usually held that pleural effusions which are not purulent require tapping only when they are large enough to interfere with respiration, or with other important functions, by pressure.

The tendency on the part of exudates to recur has been treated within the last few years by what is known as autoserotherapy. Gilbert first advanced this method in 1894, the idea being that through it some ferment substance activates the processes by which fluid is absorbed. The method consists in drawing from the pleural cavity by means of a glass syringe, attached to a suitable needle, some of the fluid which is in the chest. By drawing on the piston of the syringe it is easy to determine when 5 or 10 Cc. of fluid has been obtained. The needle, still attached to the syringe, is then partly withdrawn until the opening in the end of the needle is in the tissues of the chest wall and not in the pleural cavity. In some instances it is well to draw the point of the needle to the inner surface of the skin, and then, after deflecting it, to push it into adjacent tissues, avoiding going so deep as to puncture the parietal layer of the pleura. The fluid in the syringe is then injected into these tissues and allowed to remain there.

It is claimed that if this method is carried out under proper aseptic precaution no local or general untoward effects ensue. Indeed, in many instances it has been found that absorption of the original fluid takes place without the chest having been first evacuated by the methods we have described. Of course, it must be recalled that all physicians of experience have met with patients in whom the mere introduction of a needle and the withdrawal of a small amount of fluid has resulted in the system of the patient withdrawing the balance by absorption. Whether this is due to the fact that a few drops of the fluid enter the subcutaneous tissues as the needle is withdrawn, and thereby the physician practices involuntary autoserotherapy, has yet to be decided. The method certainly commends itself in those cases in which the patient for various reasons may be so weak and feeble that aspiration of the liquid by ordinary methods is regarded with anxiety. A considerable lit-

erature on this subject has now accumulated, and the method would seem to deserve further trial.

THE TRUE POSITION OF ADRENALIN.

Many years ago when adrenalin first appeared we called attention to the fact that it was impossible for any remedy to possess power for good without, at the same time, possessing power for harm, if it was used ignorantly or unwisely. This is true of every drug. It is inconceivable that anything which is physiologically active when properly applied shall be physiologically inactive when improperly applied. For these reasons we have taken much interest in an article which appears in the *Journal of Laryngology, Rhinology, and Otology* for February, 1916, and which we abstract for the Progress columns of this issue, with the exception of the bibliographic list of articles upon which the author bases his conclusions. He well says that adrenalin being an exceedingly active preparation of fleeting influence upon blood-pressure can, possibly, be well supplanted at the present time by pituitrin, which acts with sufficient promptness in emergencies and, at the same time, exercises an influence which is more prolonged and therefore more useful. There can be no question but that both of these products have established for themselves a permanent, lasting, and wide-spread sphere of usefulness in an unusually large field of conditions.

Summarizations from time to time of our knowledge concerning these drugs, such as the one to which we call attention on this occasion, are of value in giving us clearer conceptions of the limitations of powerful and useful drugs.

PROPHYLAXIS OF TETANUS.

The comparatively large experience of tetanus afforded by the casualties of the present war has given an opportunity of confirming the high estimate of the value of serum injections in the prevention of tetanus, though as yet not with a completeness and accuracy which might seem desirable.

MacConkey (*British Medical Journal*, Dec. 11, 1915), quotes the "Memorandum on the Treatment of Wounds in War" to the following effect:

"The prophylactic use of tetanus antitoxin is a proceeding of well-established value.

"Since, in the first two months of the war, more cases of tetanus occurred than had been anticipated either by ourselves or our Allies, it was decided to direct that a preventive dose of serum should be given to every wounded man. The results have been excellent, and in the last six months there have been only 36 cases of the disease among those who received a preventive dose of serum within twenty-four hours of being wounded.

"The preventive dose of 500 U. S. A. units should be given subcutaneously at a distance from the wound at the earliest possible moment. In severe wounds medical officers not infrequently give 1500 units; there is no objection to this, but at the same time there is no evidence that the smaller dose is insufficient if given promptly."

The German reports are practically unanimous in corroboration of the views thus expressed. As to the incidence of tetanus Hinterstoisser states that in the Franco-Prussian war there were among 95,000 German wounded 350 cases of tetanus, or 0.36 per cent, whilst on the western front during two months of 1914 there occurred among 27,677 German wounded 174 cases of tetanus, making 0.62 per cent. In the Crimean war, of 12,094 wounded English 19 had tetanus (0.15 per cent). In the American Civil War, of 217,000 wounded there were 505, or 0.2 per cent. Of 51,700 Russians wounded in the Russo-Turkish war there were 66, or 0.12 per cent. Therefore the incidence of tetanus in the present war is greater than would have been anticipated from previous experiences.

As to the development of tetanus in those who have received prophylactic injections it is to be noted that this occurred in 0.26 per

cent. In many instances this is explained upon the ground that antitoxin injections were given so late that there was no time for them to counteract the effect of the toxin already absorbed. Certain anomalous cases are reported in which the failure of the prophylactic injection is not easily explained. Thus v. Behring records the case of his assistant who was infected in 1895 through the nasal mucous membrane when he was preparing dried tetanus toxin; again in 1898 by inhaling dried powered tetanus toxin—in this instance there was early tetanus of the diaphragm; again in 1902 by a litre flask of bouillon culture breaking in his right hand and pieces of glass penetrating deep into his palm. The same day a plentiful amount of antitoxin was injected into the right arm. The fourth day there were suspicions of tetanus, which rapidly progressed in spite of further injections of serum until the nerve trunks in the right axilla were exposed, and as much as possible of Behring's strongest serum was injected into each of them. Tetanus ceased to progress and the case slowly went on to recovery, but the use of the right arm was interfered with for a long time.

As to the duration of the immunity afforded by antitetanic serum, it is evident that the protective effect is distinctly ephemeral. Therefore Levin concludes that it is better to give a series of small doses rather than one large one, and holds that if the dose of 500 units is repeated at the end of a week or of a fortnight after the receipt of the wound we should not use any more serum, and we should probably get a more prolonged immunity than by giving at one dose the 1500 units which some surgeons seem to prefer.

Cases are reported of very late development of tetanus. Thus Don notes the case of a man wounded in the shoulder December 21, 1914, and given a prophylactic injection, who developed tetanus March 2, 1915. Tetanus bacilli were found in the pus. Gardner and Bawtree state that a wounded man may act as a carrier of tetanus bacilli for at least two months after the date of the wound, and without any reason on clinical grounds to suggest that these bacteria are present in the tissues. It is further suggested that the surgeon may be the cause of the development of tetanus by the use of procedures which under ordinary conditions would be quite harmless, but which are not safe owing to certain peculiarities of the tetanus bacillus. It has been experimentally shown that tetanus spores may remain in the tissues of a guinea-pig for about four weeks, and at that time may be activated by injections of quinine or of staphylococci. White mice will harbor tetanus spores in the subcutaneous tissues for at least four months, at the end of which time the spores may be activated by staphylococci but not by quinine, and at the site of inoculation there may be produced as much as 10,000 mouse minimal lethal doses of tetanus toxin.

Fleming examined bacteriologically 127 wounds within seven days of infliction, and found tetanus bacilli to be present in 22 of them.

Bond records cases in which after all incisions and sinuses round a compound fracture involving the elbow-joint or hip or other joint had completely healed, even simple passive movement of the joint under an anesthetic has lighted up a violent reaction, the reappearance of the old sepsis and the formation of local abscesses, although no incision was made, nor any solution of skin surface produced.

Berard and Lumiere speak of cases of tetanus following some operation or trauma affecting a wounded soldier who had a prophylactic dose of serum and had long recovered apparently from his wound. It is regarded as imperative when an operation is proposed in the wounded who may have been infected with the tetanus bacillus, to bear in mind that there may be toxin circulating in the body, and to give them a large prophylactic injection intravenously. Behring notes that the amount of antitoxin present in 1 Cc. of blood a few minutes after an intravenous injection of antitoxin remains constant for nearly sixty minutes.

REPORTS ON THERAPEUTIC PROGRESS.

THE SIMILARITY AND SYNERGY OF MORPHINE AND STRYCHNINE ACTION.

In the *Journal of Pharmacology and Experimental Therapeutics* for November, 1915, McQuigan and Ross report a research on this subject and say that from the work recorded the following conclusions may be drawn:

1. Morphine when injected intraspinally into mammals (dogs and cats) in adequate doses will produce tetanus after a latent period. Codeine which is apparently not oxidized in the body will not produce tetanus.

2. Morphine when oxidized to a certain degree and injected into the spinal canal of dogs and cats, or into the lymph sac of frogs, will produce tetanus more quickly than unchanged morphine. Artificially oxidized codeine will also produce tetanus when injected in this way.

3. Oxidized morphine when administered otherwise than directly into the cerebrospinal fluid will not produce convulsions in mammals (dogs).

4. The strychnine-like action of morphine is apparently due to an oxidation product which is first produced and then destroyed in the body. Differences in the rate of oxidation will explain the varied reaction in different animals.

ARTIFICIAL PNEUMOTHORAX IN TUBERCULOSIS.

Considering this topic in the *Boston Medical and Surgical Journal* of November 11, 1915, Otis states that there seems to be no doubt that the unilateral cases with but little or no infiltration in the other lung, and that inactive, and where there is still a fair amount of resistance, offer the most favorable conditions for this treatment and give the best results. The percentage of such cases which are either arrested or greatly improved is placed as high as forty or fifty (Floyd).

To assume that if the operation does no good it will do no harm is, the writer believes, false; for there is always the possibility of pleural shock, gas embolism, subcutaneous emphysema, infection of the pleural cavity, disturbance of the blood supply from displacement of the heart, and a lighting up of the inactive process in the other lung. It is an operation that should only be entered upon advisedly, discreetly, and in the fear of these possible dangers. One must also bear in mind that although he may consider the operation a very simple one, to the patient it means an operation, with all the dread that the word suggests, and he will not infrequently elect to take his chance without it when it is advised rather than undergo the mental anguish which the fear of an operation produces. This fact again reduces the number of cases to which can be applied the pneumothorax treatment.

A word with regard to the *x*-ray. The consensus of opinion is, the writer thinks, that one is not justified in carrying on the treatment without constant access to the *x*-ray with a skilled technician. Before beginning the inflation a careful study of the *x*-ray picture of the lungs should be made and subsequently, both before and after each inflation; only in this way, by ocular evidence, can we be sure that the case is a favorable one for the treatment, and determine its success. Moreover, we can thus avoid many of the dangers incident to it.

As to the apparatus employed, there are almost as many kinds, or modifications of one or another kind, as there are operators. The main requisite is to use an instrument with which one is familiar, and which is as simple as the conditions will allow. Whatever the apparatus used, it should have a good manometer which can be easily read, and an arrangement whereby the flow of gas can be readily regulated as to pressure, and be steady. One of the most satisfactory forms of apparatus which has come under the writer's observation is that of

Professor Deneke of St. George's Hospital, Hamburg. In brief, it is made double. Upon one side of an upright standard is a complete arrangement for the injection of nitrogen gas, and on the other side is a replica of the same for the injection of oxygen gas, Professor Deneke's idea being that greater safety is insured if on the first injection oxygen is used, so that if by any chance the needle may have entered a vessel, the oxygen gas on account of its rapid absorbability will be much less likely to produce gas embolism. By simply turning a stop-cock, nitrogen gas can be substituted for the oxygen gas.

There have also been as many kinds of needles as apparatus, each operator having his favorite one. Deneke's needle seems to the writer to have certain advantages, its peculiar characteristics being its extreme simplicity, consisting of a cannula and stylet, the cannula having a less acute angle at its perforated end than the ordinary needle, and is closed at this extremity, the opening being in the side just above the point.

There are many other problems in connection with artificial pneumothorax which could with great interest be discussed, such, for example, as the amount of positive pressure permissible in case of adherent pleura, the amount of gas introduced at any one time and the frequency of introduction, the length of the time the treatment should be continued, the effect upon the neighboring organs, the contraindications, and the employment of the treatment in recurring pleuritic effusions, bronchiectasis, and abscess.

The scope of artificial pneumothorax is apparently not yet fully determined, but that it has won a permanent place in the treatment of tuberculosis is assured. In the very conservative words of Saugman, "it has fully justified its place in the treatment of some severe cases of pulmonary tuberculosis, and by it recovery sometimes may be obtained when any other treatment would have failed." It is well to bear in mind, however, that it does not by any means take the place of the well-known measures for increasing and maintaining the resistance, such as fresh air, rest, and good and sufficient food, but, like tuberculin, it is an additional aid in certain cases and may save the day.

BLOOD TATTOOING OF THE SKIN FROM HYPODERMIC INJECTIONS OF MORPHINE.

In the *Proceedings of the Royal Society of Medicine* for July, 1915, PARKES WEBER records the case of a woman, aged sixty-seven, a morphinist, who from the age of twenty-seven to the age of fifty-nine had been accustomed to take morphine, almost entirely by the mouth, up to 8½ gr. per diem. She then entirely discontinued taking the drug until after an operation for gall-stones, about four years ago, when she got into the habit of giving herself hypodermic injections of morphine and atropine. Since then she had usually, in the course of every day (twenty-four hours), injected from 1 2/3 gr. to 3 1/3 gr. of morphine sulphate, together with from 1/24 gr. to 1/10 gr. of atropine sulphate, under the skin of her upper extremities or the upper part of the front of her chest. At the present time the skin of these regions had a stippled appearance from innumerable minute bluish spots, each bluish spot marking the site of a former hypodermic injection.

These bluish spots constituted a kind of tattooing; probably some iron substance derived from the needle of the hypodermic syringe had on each occasion remained under the skin. Similar bluish spots in the skin of a morphinist (a man) under the care of Dr. Francis Hare were due, as Dr. Hare kindly informed Dr. Weber, to minute carbon particles introduced under the skin with the hypodermic syringe, as the patient had been in the habit of disinfecting the needle of the syringe in the flame of a wax match or of a wooden match. In fact, in that case the bluish spots were due to a genuine blue-black tattooing, since for that purpose the finest quality of Indian ink or Chinese ink (which consisted of very minute particles of soot or carbon) was, Dr. Weber be-

lieved, usually employed. Dr. Hare's patient had been distressed in regard to the presence of the bluish spots, for he regarded them as very "tell-tale," and likely to prevent him from obtaining a desired appointment. In Dr. Weber's case, though the bluish spots exactly resembled those produced by tattooing with carbon particles of Indian ink, it seemed far more probable that they were produced by minute iron particles from the hypodermic needle, since the patient had always cleaned the needles, she said, by washing them out with hot water, and had never disinfected them in any flame. Similarly, workers in some trades developed blue marks in the skin from the entry of particles of iron.

In addition to the bluish spots the patient had a few little hard fibrous nodules in the subcutaneous tissue, resulting also doubtless from hypodermic injections.

THE RESULTS OF THE EXAMINATION OF CULTURES FROM SUSPECTED CASES OF DIPHTHERIA AND OTHER PHARYNGEAL AND NASAL CONDITIONS.

MOFFIT in the *Pennsylvania Medical Journal* for October, 1915, reaches these conclusions from an investigation he has carried on:

1. Diphtheria cannot be diagnosed in its early stages without the assistance of the laboratory.

2. In case of negative reports on examinations for diagnosis, subsequent cultures should be taken in suspicious cases, to eliminate the possibility of mistakes.

3. The throats of patients having had diphtheria are not free from the bacteria at any given time after the onset of the infection.

4. Negative cultures should be found before quarantine for diphtheria is removed.

5. When diphtheria bacilli persist in the throat after all other manifestations of the disease have disappeared, they may often be readily eliminated by the use of buttermilk as a gargle.

6. Virulent diphtheria bacilli may be present in a nose or throat without causing any symptoms in the nose, though capable of causing the disease in contacts.

7. Membranous laryngitis or croup may be caused by the pneumococcus, and such an infection may prove fatal.

EXOPHTHALMIC GOITRE.

CAMPBELL in the *Clinical Journal* of October 13, 1915, says that treatment is not satisfactory. This is evident from the multitude of the remedies which have been from time to time advocated for the cure of exophthalmic goitre. One reason for the failure that is so frequently met with from some line of treatment, whilst success may follow a directly opposite method, is due to the assemblage under one name of cases which differ essentially in their pathology. For instance, if all the cases which show some enlargements of the thyroid, occasional palpitation, and perhaps slight exophthalmos are to be classed as cases of Graves's disease, then he thinks we are bound to flounder hopelessly in treatment, for the large majority of cases showing these symptoms in a mild degree are merely due to blood-pressure changes, associated with anemia, as the result of or in conjunction with the onset of menstruation. Again, all cases of hard goitre in which there is insufficiency in thyroid secretion, associated with an interstitial cirrhosis, must be excluded, even though they show some slight exophthalmos, for in them the rational treatment is either the administration of thyroid juice or of iodine in some form, the latter being a powerful excitant to the secreting cells of the gland.

These cases account, the writer thinks, for the successful results attributed to potassium iodide or thyroid feeding in certain cases which have some of the attributes of Graves's disease. It is, of course, in the late stages of Graves's disease, when hypertrophy is being succeeded by atrophy and over-activity by under-activity, that this line of treatment is the right one. These latter

are no longer, however, cases of Graves's disease, but of early myxedema. Limiting oneself, then, to cases of true Graves's disease, the writer might first mention various forms of treatment which have been used, but which have given rise to very contradictory reports as to their permanent efficacy. *X*-ray treatment has been credited with having cured a large number of cases, and the immediate results are often very striking, but as to permanent cure the reports are conflicting. This may be accounted for by the fact that failure certainly followed this method of treatment in many of the early cases, but recent reports with improved technique have been very encouraging. It must, however, be borne in mind that occasionally disastrous skin changes may occur many months after the treatment has been discontinued.

The serum treatment is based upon the view that normally the thyroid secretion acts as an antidote to certain autotoxins developed elsewhere in the body, and, conversely, that these autotoxins serve to neutralize the thyroid secretion. If this hypothesis, and it is only a hypothesis, be true, then when the thyroid secretion is present in excess it is only necessary to inject autotoxins obtained from thyroidectomized animals to neutralize this excess and so to again establish equilibrium. The method has been strongly advocated either in the form of an alcoholic ether precipitate of the milk of thyroidectomized goats (Rodagen), or antithyroid serum. The writer has not personally used these preparations to any large extent because the results of the cases in which he has employed them have not been encouraging.

Many surgeons strongly advocate complete or partial removal of the gland, stating that even in cases of complete removal there is always sufficient thyroid or parathyroid substance left to prevent the occurrence of myxedema, and that even if this latter condition should supervene it is much less serious and more manageable than Graves's disease. Tying the thyroid arteries is a theoretically better procedure, but it has not many advocates. Kocher records out of 59 cases of partial or complete thyroidectomy 76 per cent of cures, improvement in 14 per cent, slight improvement in 3.3 per cent, and death in 6.7 per cent. Most other operators have had a higher mortality, though Dreyfus collected the statistics of 127 cases in which the results were almost identical with those of Kocher. Further experience has hardly borne out these favorable results, and Halsted has recently advocated thymectomy in addition to thyroidectomy as being more beneficial than the latter operation alone.

Personally the writer has had good results with rest, fresh air, a diet rich in fats and poor in nitrogenous constituents, application of cold locally, the administration of bromide in full doses as occasion required, and the regular use of calcium. Meat juice should be prohibited and milk should be taken sparingly, as both of these act as excitants to the thyroid gland. Belladonna applied locally has seemed to be of use in some cases, but internally the writer thinks it is not to be recommended, as it certainly sometimes aggravates the mental excitability. Digitalis is of value when the heart condition indicates the need for its use, but, like many other drugs that have been recommended, it is required not for the disease but for its effects. Local electrical treatment has been advocated, but whilst the good derived from it is doubtful, it certainly in some cases does harm. It is useless, whatever the treatment adopted, to expect rapid results, and in many, in spite of all treatment, the psychic symptoms develop, the emaciation increases, and the end comes either from some intercurrent malady, such as pneumonia, or with startling suddenness from heart collapse. In cases of pregnancy, in which the mental loss of equilibrium is often associated with and probably to a large extent caused by the hyperactivity of the thyroid, improvement of the thyroid condition is accompanied by a corresponding improvement in the mental affection. In forecasting the future in a case of Graves's disease it is important to bear in mind that in many cases the disease occurs in those of a mark-

edly neurotic or degenerate type, and that, altogether apart from the thyroid disease, the case may be mentally going downhill. Bearing this in mind the writer thinks that, given opportunity for efficient treatment, the prognosis, though always uncertain, is by no means as bad as is often stated, and that recovery, complete and lasting, occurs in a considerable proportion of cases.

IODIDE OF SILVER IN OCULAR THERAPEUTICS.

MOLONEY says in *the Clinical Journal* of October 12, 1915, that as a general practitioner it has often appeared odd to him that there should be so few drugs which can be locally applied to the eyes for, say, the cure of corneal opacities and conjunctivitis, both in its angular and other forms, and for the treatment of gonococcal ophthalmia. Protargol, it is true, is a useful but expensive agent. The ideal therapeutic agent in ocular troubles must be highly antiseptic, astringent, non-irritating, alterative, and rapid in action. Iodide of silver, which is inexpensive and easily made, possesses all these qualities, and has given the writer highly satisfactory results.

The old method of rubbing in the oxide of mercury in the hope of removing opacities in the cornea is certainly slow and wearisome, and requires much labor and patience; besides it is highly irritating. The cornea has no lymphatics, and the oxide of mercury is not a soluble salt, and consequently the amount absorbed must be small.

From the consideration of pathological, histological, and anatomical facts as regards the cornea, it will be obvious that the efficacy of the ointment of yellow oxide of mercury is mostly due to its mechanical action. Hence the value and usefulness of the iodide of silver will be understood.

Being troubled with a corneal nebula Moloney perseveringly used oxide of mercury ointment for some weeks, producing irritation of the lids and little benefit. He cast about for an efficacious remedy. Iodide of potassium would, of course, have been the drug were it not too irritating to a mucous membrane. It occurred to him to use a salt which combined the activity of iodine with the astringent and antiseptic qualities of silver. He tried iodide of silver, and to his intense surprise vision began to improve after the first twenty-four hours. Eventually he showed the eye to a specialist, and he said that the nebula had got very thin.

In the use of this salt, as in the case of most ocular astringents, there are certain contraindications which must be observed to prevent disastrous results. In distinction from some German salts there is no danger of argyriasis, nor does it stain the skin as the nitrate of silver does.

The writer always begins with a solution of 5 grains to the ounce. In gonorrheal ophthalmia it is most efficacious. One drop of a weak solution instilled three times a day or oftener in cases of extensive chemosis and danger of corneal sloughing alters the condition in a few days. Again, in cases of chronic palpebral conjunctivitis, in which a weak perchloride of mercury solution is indicated, the iodide of silver acts quickly. Moloney had also satisfactory results in the treatment of pannus with this salt; in ulcer of the cornea it should be cautiously used, as his experience on this point is not sufficient for him to make a positive statement. All he can say is that it promises to be of use.

As bacteria play an important part in diseases of the conjunctiva and a bacteriological examination is made before cataract extraction, the utility of an instillation of salt will be obvious, especially as its action on the gonococcus is so potent.

ENDAMEBIC DYSENTERY.

In the *New York Medical Journal* of October 23, 1915, BARLOW claims that about eighty per cent or more of cases of infection with Endamœba histolytica remain free from relapse for seven months or more, if treated for at least ten days continuously with not less than one grain daily of emetine.

If treated for less than nine days, relapse is almost inevitable.

The simultaneous administration of ipecac does not diminish the number of patients who show relapse; but the subsequent administration does diminish the number.

A permanent cure is possible in a shorter time with emetine than with ipecac.

It is preferable to inject the daily dose at one time, or at least in doses of not less than one grain.

Cases of hepatitis and liver abscess usually remain free from either intestinal or hepatic relapse, partly on account of the more thorough treatment which they receive.

The bowels should not be flushed with frequency. If there is marked diarrhea, opiates should be given in sufficient quantity to control it. The patient is relieved of suffering, and the retention of the emetine hastens the cure and decreases the likelihood of relapse.

If the patient can do so, he should report monthly for at least six months to some one competent to recognize either cysts or vegetative forms. Examination should be made after a saline, and immediately after the stool is passed. If either is found, another course of emetine, of at least one grain daily for nine days, should be given. The alternative is the continuous or intermittent use of ipecac for at least six months, or successive courses of emetine of at least nine days.

Infections with Craigia are difficult to cure. They are best treated with ipecac and emetine in combination; but the treatment must be continued for at least one month, and even then a large proportion of relapses must be expected.

As dysentery is very prevalent around New Orleans, the plans of treatment which men prominent in the profession have adopted as a result of large experience are of value.

Weis gives emetine one-half to one grain daily for five days, then sixteen salol-coated five-grain pills of ipecac, diminishing one pill each day for ten days; then repeats the treatment and on discharge gives the patient 60 to 100 pills, to be taken two each night.

Bel uses both emetine and ipecac, according to the requirements of the case, until a clinical cure is accomplished, and lays great stress upon an intermittent treatment by ipecac for from six to twelve months following.

Elliott gives from one-half to one grain daily, from fifteen to thirty days, accompanied by ipecac in decreasing doses, to be followed by an intermittent treatment by ipecac for several months.

It is to be understood that the foregoing outlines are only general plans, to be altered and supplemented to meet the requirements of individual cases.

The plan which the author considers best, according to our present knowledge, can be carried out only with intelligent patients who are within reach of a competent laboratory worker. One grain (or more, for one or two days) is given daily for fifteen days, followed by sixty to eighty grains of ipecac for from five to twenty days, according to whether intestinal irritation is produced or not. The bowels are cleansed by a saline at the beginning of treatment, and about every five days. If there is either diarrhea or colic, it is checked by opiates, usually paregoric, in small repeated doses, until comfort is obtained. If severe diarrhea is present, liquid diet and rest in bed are required until the symptoms improve, when a more nourishing diet and gentle exercise are allowed. On discharge the patient is instructed to return once each month for examination of a fresh stool obtained after a saline cathartic. If either endamebas (of any variety) or cysts of Endamœba histolytica are found, the treatment is repeated.

Of eighteen patients treated in this way, who left within seven months after treatment, all but four were both clinically and microscopically well from three to six months after treatment.

This plan has three advantages: First, even intelligent patients are not likely to keep up a prophylactic treatment, while if amebas are actually found they will readily take a second treatment. Second, when they are clinically well, and with merely a latent infection, the second course of treatment will usually result in a complete cure, while

with an empirical after-treatment with ipecac from six to twelve months must elapse, and even then several examinations are necessary to be certain of cure. Third, the repeated examination of cases results in the accumulation of data which make it possible to determine the dose and duration of treatment necessary for permanent cure, and is, therefore, of the highest scientific and practical value.

As this report does not pretend to be a discussion of the use of emetine, but only a small contribution to the knowledge which must be accumulated before the question of proper doses can be decided, no review of the literature is attempted, and only such references are given as have a bearing upon the point at issue.

ACUTE OTITIS MEDIA IN INFANCY.

In the *Boston Medical and Surgical Journal* of October 21, 1915, EMERSON says that in all primary infections of the respiratory tract, and especially in affections of the respiratory tract secondary to contagious diseases, care should be exercised to keep the nasopharynx free from mucus and crusts that may cause occlusion of the Eustachian tube. Two or three drops of liquid albolene or of a 10-per-cent solution of argyrol may be introduced into each nostril three times a day. During the stage of acute nasal congestion steam inhalations are helpful. An even temperature should be maintained in the room. The child should be protected from strong winds and dust. The air in overheated houses and flats becomes exceedingly dry and consequently irritating. Receptacles for water attached to the side or placed on top of radiators will evaporate one to two gallons daily, appreciably increasing the humidity. In older children the following ointment is employed:

Menthol, grs. vij;
Eucalyptol, grs. vij;
Lanolin, drachms vj;
Vaselin, drachms ij.

Applied inside the nostrils this protects the congested turbinates and so keeps the nares clear. Also in older children, in cases of excessive discharge from the throat, irrigations of hot normal salt solution two or three times a day free the nasopharynx from muco-pus. The irrigation may be done by the physician with a metal syringe or by the nurse with a fountain syringe, inserting the glass part of a curved eye-dropper into the end of the rubber tube and so directing the stream into the throat and allowing it to flow out into a pus basin, with the patient lying in bed. A spray of menthol, 5 grains, and benzoinol, 1 ounce, should be used with an atomizer to protect the inflamed mucous membrane from irritation. Swabbing the throat with iodine, 20 minims to the ounce of glycerin, is also useful.

If, notwithstanding these precautions, the Eustachian tube becomes occluded and the drum membrane begins to show congestion along the handle of the malleus, the following treatment should be given to open the tube: a mixture of four drops of adrenalin solution 1 to 5000, and cocaine one-half to 1 per cent, should be allowed to flow through the nostril on the affected side, back into the throat, the patient's head being tipped backward in such position as to cause the solution to flow toward the orifice of the tube. This should be followed in five minutes with a few drops of a 20-per-cent argyrol solution, which by its higher specific gravity keeps the tube open. This should be repeated in three hours if there is pain. Frequently the symptoms, congestion and temperature, will disappear with this treatment. If, however, the inflammatory process continues to progress and the symptoms increase, the drum should be incised without waiting for bulging or pus. The operation should be performed by the aurist, if available, otherwise by the attending physician, because the majority of these cases have a mixed infection, and a delay of even a few hours may result in rupture of the drum and burrowing of pus into adjacent structures. The attending physician can safely make a curved incision of the drum, extending from the posterior lower quadrant up to the attic, under direct vision. A rapid fall in temperature and alleviation of symptoms should follow. Re-

peated incisions should be made, if necessary, for free drainage, but it should be remembered that obstruction of the Eustachian tube in the throat may prolong a discharge from the ear. In infants etherization is not necessary, but in older children enough ether should be given to allow time for a careful and accurate incision. The other ear should be watched with special care as a double otitis is frequent.

In every case of contagious disease and of affections of the respiratory tract in children, measures should be inaugurated at once to keep the nasopharynx clear and so maintain drainage through the Eustachian tube. In such cases the ear drum should be inspected at every visit of the physician.

An electric ear instrument gives a clear picture of the drum with a minimum disturbance of the child.

In cases of otitis media when the symptoms and the local condition do not improve under treatment, the drum should be incised by the aurist, if available, otherwise by the attending physician, without waiting for bulging or pus.

Every child after an attack of acute otitis media should have his epipharynx examined and treated by a specialist trained to recognize the close relation of the nasopharynx to the ear.

THE SPINAL FLUID IN SYPHILIS AND ITS RELATION TO TREATMENT.

In the *New York State Journal of Medicine* for October, 1915, MILLER admits that many phases of the relations of the cerebrospinal fluid to the diagnosis, prognosis, and therapy of syphilitic disease of the central nervous system have been inadequately treated or omitted entirely in his paper. He thinks, however, that enough evidence has been brought forward to warrant the following conclusions:

1. The central nervous system is not infrequently invaded by the Treponema pallidum in the earliest stages of its generalization in the human host. This fact is conclusively proved by the frequency with which abnormal changes may be demonstrated in the spinal fluids of individuals in the acute secondary period. Of the total number showing such changes, only a small percentage subsequently develop luetic disease of the nervous system. The precise factors which determine this incidence are not yet known.

2. Certain fairly characteristic and regular reactions in the cerebrospinal fluid are of pronounced value in the diagnosis of syphilis of the brain and spinal cord. No one is pathognomonic of any condition. Conclusions, therefore, to be of any value, must be based upon the analysis of all available clinical and laboratory data.

3. There can be little doubt as to the wisdom of making periodic spinal fluid examinations in all cases treated or not, known to have had a luetic infection. The information to be gained will doubtless prove of great value, first, in the prevention of tabes, of cerebrospinal lues, and of paresis; secondly, in broadening our knowledge of the exact processes underlying these diseases; thirdly, in determining the conditions, biological and physical, which favor their occurrence; and fourthly, in controlling the efficiency of our therapeutic measures.

4. There is urgent need for standardizing the methods of spinal fluid examination and the Wassermann reaction. The varying and discordant results of good observers is in part due to the employment of different methods and the expression of presumably identical results by all sorts of different terms or symbols. It is felt that the adoption of a uniform technique would greatly advance our knowledge, make possible the comparison of a greater number of cases, and serve as a more reliable check upon the benefits of various forms of treatment.

5. The chief point to be emphasized is the urgent need of diagnosing syphilis of the nervous system before the causative organism has been able to build up its defensive mechanisms and to initiate irreparable degenerative processes in the tissues of the host. This can probably be done, in part at least, provided intelligent use be made of lumbar puncture.

THE TRUE POSITION OF ADRENALIN.

The *Journal of Laryngology, Rhinology, and Otology* for February, 1916, contains an editorial in which the following statements are made:

That adrenalin is regarded as a dangerous drug by many pharmacologists and anesthetists comes with a shock of surprise to otolaryngologists, accustomed as they are to use it, locally, at all events, in a very lavish manner. For the general opinion among throat and ear surgeons undoubtedly is that adrenalin is a safe as well as a powerful remedy, particularly in cocaine poisoning and in condition of surgical shock, therein agreeing with Brünings, who says:

"In the course of one or more minutes ½ to 1 Cc. of the usual 1:1000 solution" (of adrenalin) "(or, better still, the corresponding quantity of a ten times diluted solution) is injected into a vein. Thereupon the mucous membranes lose their color almost at once; an enormous rise in blood-pressure takes place, and the heart, under the influence of the direct action of the adrenalin, often begins again to beat, when all other stimulants had failed" ("Die direkte Laryngoskopie," p. 173, f. n.).

When, however, we listen to recent workers upon the pharmacology of adrenalin, we discover that a proceeding such as this of Brünings would be regarded by them with serious misgivings.

Injected directly into a vein, as Brünings directs, adrenalin induces a wide-spread series of phenomena which Elliott has shown to be due to stimulation of the sympathetic nerves all over the body. To begin with, there is a general contraction of arterioles, save in the lungs, the brain, and the heart, in consequence of which a great rise in blood-pressure occurs. Obviously, if the heart be weak, the obstruction to its efforts produced by the general vasoconstriction may have serious consequences, unless, as Brünings says, the action of the adrenalin upon the heart muscle is of a stimulating character. As to this, if we are to credit recent observations, Brünings and the rest of us are wrong. Watson points out that the rise in blood-pressure affects the systolic phase only, the diastolic pressure being actually much lower than normal. These are the characters of the blood-pressure readings in aortic regurgitation. Consequently Watson suggests that adrenalin prevents the normal closure of the aortic valves by its dilating action upon the muscular tissue of the root of the aorta. If this be true, then the rise in blood-pressure after the injection of adrenalin is misleading as an indication of an increase in the vigor of the circulation.

In opposition to this opinion, however, we note the statement of a well-known pharmacologist, such as Cushny, that the effect of the drug upon the sympathetic nerves of the heart leads to an acceleration and augmentation of the beat, which, after a longer or shorter period of reflex vagus inhibition, recurs and persists until the action of the drug has passed off.

Thus opinion does not seem to be quite decided on the point.

Again, adrenalin given hypodermically in the course of chloroform narcosis has on several occasions been followed by the collapse and death of the patient, an action which Levy has attributed to cardiac fibrillation.

For this reason Mortimer and others have uttered warnings against the use of adrenalin, not only intravenously, but even hypodermically, during chloroform narcosis and in shock.

Watson, indeed, goes so far as to say that "adrenalin is a dangerous drug which should always be used with caution and never as a general blood-pressure elevator," which is exactly opposite to Brünings' advice given above.

Which is correct?

Most practicing otolaryngologists, arguing from their own experience of adrenalin in all sorts of conditions, will probably be inclined to side with Brünings, and to look upon adrenalin as being not only harmless, but also useful in counteracting and relieving surgical shock. To begin with, there is no doubt whatever that, when cocaine is used for surface anesthesia in combination

with adrenalin, cocaine poisoning is less frequent than when the former is used alone. Again, when adrenalin is combined with novocaine and eucaine and used in infiltration anesthesia, shock both during and after operation is certainly much less severe than when a general anesthetic is employed.

It is true that when adrenalin is used in these ways the local ischemia, which is at once induced, sets up a barrier to the rapid absorption of the drugs into the general circulation. Nevertheless, it is against the hypodermic use of adrenalin, no less than against its intravenous administration, that Watson and the anesthetists have uttered their warning.

Then, again, there is the use of adrenalin hypodermically in the treatment of asthma, a method which its success is rendering exceedingly popular. The apparent mystery of the action of adrenalin in asthma, by the way, is cleared up by Cushny, although, curiously enough, he does not seem to mention its employment in this complaint.

"Adrenalin," he says, "injected intravenously dilates the bronchi widely, an effect which is especially noticeable when they have been previously contracted by pilocarpine and physostigmine. This is not the same as the dilatation caused by atropine, but arises from adrenalin stimulating the terminations of the bronchial sympathetic fibers, which causes relaxation of the muscle." ("Text-book of Pharmacology and Therapeutics," sixth edition, 1915, p. 368.)

The present writer has a vivid recollection of a case in which, after a nasal operation had been performed upon an asthmatic patient under chloroform, an alarming attack of asthma set in as he was coming round from the anesthetic—the usual time for such an event, we may remark. The breathing became more and more labored in spite of all efforts to relieve it, and cyanosis was being followed by the ominous livid pallor that signals the imminent failure of heart and respiration when 5 minims of adrenalin solution (1:1000) were injected hypodermically. The effect was magical. In about half a minute the spasm ceased, and the breathing became quiet and peaceful, with a rapid restoration to the normal in the color of the lips and face.

It is said that the habitual use of adrenalin in asthma is likely to lead to arteriosclerosis. At all events, a German experimenter has reported this as having occurred in animals. Whether his observation has ever been confirmed or not it is difficult to say. The belief in such an ending, nevertheless, has obtained a wide currency. All the same, most asthmatic people seem inclined to risk the arteriosclerosis.

Equally in opposition to those who look upon adrenalin as a dangerous agent is the practice, suggested and carried out by Milian (see *Journal of Laryngology, Rhinology, and Otology,* vol. xxix, p. 168), of counteracting the depressant effects of salvarsan upon the circulation by an intramuscular injection of 1 to 2 Cc. of a 1:1000 solution of adrenalin, immediately before the arsenical compound is administered.

From the foregoing remarks, then, it will be seen that in this matter of the action of adrenalin upon the system there seems to be considerable disagreement between the clinician and pharmacologist, a by no means unprecedented occurrence, and one which is, probably, to some extent traceable to the fact that the clinician is an observer of the action of the drug in abnormal conditions, while the pharmacologist records its behavior in normal conditions. Watson's experiments, for example, were carried out in healthy young men and women, in whom, of course, the blood-pressure behaves quite differently from what it does in asthenic persons.

In chloroform narcosis, again, the occurrence of a few fatalities after adrenalin had been injected may only have been a coincidence. Levy's explanation, that death was due to the adrenalin setting up fibrillation of the cardiac muscle, is vitiated by the fact that chloroform itself is said to induce fibrillation at times, and to cause death by doing so. And when it is remembered how frequently adrenalin is employed during surgical operations under chloroform without any apparent ill effects, one feels even less inclined to adopt the opinion that it is

particularly dangerous to employ adrenalin under these conditions.

A survey of the whole question, then, in all its bearings, leads us to the conclusion that the case against adrenalin is, for the present, not proven. Further investigation on the part of the pharmacologist is needed before the reliance of the operating surgeon upon the safety of adrenalin can be broken. At the same time, the latter cannot avoid being influenced by the warnings which have been given, to the extent of keeping a weather-eye open to the possibility of trouble arising from this source. The natural tendency, no doubt, will be to limit the application of adrenalin to mucous surfaces and to subcutaneous tissues, and to avoid the intravenous administration of the drug. The last-mentioned method is, of course, only adopted in combating shock, and we possess in pituitrin, for example, an agent which seems to be almost, if not quite, as powerful a remedy for this disturbance as adrenalin is, without, as far as we know, any of the reputed dangers of the latter substance.

THE CHOICE AND TECHNIQUE OF THE ANESTHETIC.

In the *Journal of the American Medical Association* of October 23, 1913, BEVAN sums up our knowledge concerning the choice of methods for inducing surgical anesthesia. Chloroform because of its efficiency, comfort, and simplicity has probably been employed more generally the world over than all other anesthetics combined. And yet the time has come when chloroform in spite of its many advantages should be absolutely and finally discarded because of the huge mortality attending its use both on the operating table and the late chloroform deaths, and because there are for all classes of surgical cases efficient and much safer agents. It is possible that in military surgery chloroform may still find a legitimate place.

Ether by the open drop method is the safest general anesthetic known for producing prolonged anesthesia. It should be today the standard anesthetic in the surgical clinic. The discomfort of ether anesthesia when properly given by the open drop method by an expert can usually be practically eliminated. In the few cases in which the repugnance to ether is great, the sequence of gas-ether can be employed.

The closed method of giving ether is not satisfactory or so safe as the open drop method. Complicated apparatus to control the percentage of ether and to warm ether possesses no advantages over the simple drop method, and should be discarded. The giving of ether by the drop method is an art which must be acquired under the instruction of an expert.

Gas should be one of the general anesthetics employed in the surgical clinic. Its place should be for short anesthesias in which unconsciousness is desired and local anesthesia is not applicable—in reducing fractures and dislocations, opening abscesses, and in some more prolonged operations in which for special reasons gas becomes safer than ether, such as operations on the urinary organ with kidney insufficiency. A surgical clinic which does not frequently employ gas anesthesia is, from the standpoint of anesthetics, a poorly conducted clinic.

As a general anesthetic, scopolamine and morphine are to be absolutely and finally rejected both from general and obstetric practice. After it was generally agreed that scopolamine and morphine were too dangerous for use as an anesthetic, an extended trial of routine small doses of scopolamine and morphine preceding the general anesthetic was made, especially in Germany. The sequence has been responsible for many deaths. The evidence from the literature shows beyond question that even in small doses ¼ grain of morphine and 1/150 grain of scopolamine before chloroform, ether, or gas adds distinctly to the risks of the patient. It complicates the giving of the general anesthetic. It masks danger-signals. It adds to the percentage of vomiting and inability to void urine. It carries with it no advantage and many disadvantages, and should be rejected. It is not a good thing; it is not a kindness to a pa-

tient to bring him to the anesthetizing room dopey and flighty. For some time after the writer had finally rejected scopolamine and morphine before a general anesthetic, he continued to employ it before using local anesthesia. He has now discontinued it, and finds his results much more satisfactory and the local anesthesia quite as complete. In using local anesthesia, one must have the coöperation of the patient, and this one can have better with the patient in normal condition than when he is dopey. He has been pleased to find also that the occasional vomiting which occurred after his local anesthesias has practically ceased since discontinuing scopolamine and morphine, and that in his hernia operations the inability to void urine and the necessity to use a catheter do not occur. Preceding either the general or the local anesthesia, morphine and scopolamine should be rejected.

It is, of course, frequently necessary to use morphine on account of pain in surgical cases which later require operation under anesthetics, and where the indications are clear morphine should not be withheld because the patient is to be given an anesthetic. The anesthetist should be informed of the fact that the patient has had morphine.

That anesthesia can be produced by injecting cocaine and its substitutes into the cerebrospinal fluid of the cord is an interesting fact. The method, however, has no place in surgical practice. It is too dangerous to warrant its employment, and for every surgical condition requiring an anesthetic, there are safer and more efficient methods at our disposal.

Blocking has but a limited field. Blocking of the Gasserian ganglion, brachial plexus, etc., should be rejected. These are in themselves important surgical procedures, and cannot compete at all with the simpler and safer methods which are at our disposal. In dental surgery the blocking of the inferior dental and branches of the superior dental nerves has a very useful field. As a rule, nerve blocking should be limited to the blocking of nerves which appear in a dissection made under local infiltration anesthesia, as blocking the ileoinguinal nerve in a hernia operation under local anesthesia.

The writer believes that in local anesthesia with novocaine and adrenalin we have a very safe and satisfactory method which should be employed in a large group of cases. Wilms is using it in a majority of his operations in the Heidelberg clinic. The writer is not prepared to go that far. He does not believe that the range of local anesthesia should be stretched too far. He is using it in about 30 per cent of his cases.

Intravenous anesthesia with ether is too dangerous, too complicated, has no special advantages, and should be rejected.

Rectal anesthesia should be rejected.

Intratracheal anesthesia is dangerous. It is complicated and it possesses advantages in very few cases. When it was introduced it was welcomed as a simple method which had been experimented with in thoracic surgery. As a matter of fact, both the complicated differential pressure and the intratracheal methods have practically been largely eliminated as a result of further investigations in thoracic surgery, which have demonstrated the fact that most of the operable cases in thoracic surgery can be done either under local anesthesia or drop ether or gas and oxygen; that the necessity of preventing collapse of the lung when but one pleural cavity is opened was theoretical and not real; and lastly, by the fact that the extensive work in which both pleural cavities are involved, and such extensive work as attacking the thoracic part of the esophagus, cannot as yet be accepted as warrantable surgical procedures; furthermore, the introduction of the simpler method of intrapharyngeal anesthesia has eliminated the intratracheal method from the field of head surgery, in which for a time it seemed to have a place. On the whole, therefore, intratracheal anesthesia has little place in practical surgery.

It has been shown that with percentage-measuring machines there is danger of continuing too long the high percentage vapor —that is, the anesthetist watches the dial of his machine and not the patient. A jar which will allow air to pass over the ether,

through the ether, carried over the ether without coming into contact with it at all, or any combination of the foregoing routes, is easily constructed, cheap, and satisfactory. The rate of administration of the anesthetic may be governed by the same guides as in the drop method.

There appears to be no reason for the adoption of any of the expensive and more or less complicated ether-warming or percentage-measuring machines which are offered for sale.

After analyzing Crile's work and the work of competent physiologists, the writer has been forced to the conclusion that there is no scientific basis for Crile's statement that he can wholly prevent shock by sequestering the brain from the field of operation by blocking the nerves with novocaine. Crile's excellent surgical work is done not because of anociassociation, but in spite of it. The complicated sequence of scopolamine and morphine, gas, oxygen, ether, novocaine, and quinine and urea hydrochloride is a method open to many objections. The scopolamine and morphine, as the writer has attempted to show in this analysis, add distinctly to the risks of the patient and should be omitted. The gas-oxygen plus ether, if used alone, is an acceptable anesthetic sequence, but not so safe as a routine as drop ether and gas and oxygen used alone in properly selected cases. Novocaine used alone in the infiltration anesthesia is of great value and has a wide field of usefulness. Used in this sequence it has little value, certainly none in preventing shock. Quinine and urea hydrochloride has no value in this sequence, and used alone as an anesthetic cannot compete with novocaine and adrenalin. The writer believes, therefore, that we must reject both the theory and the practice of anociassociation.

The final results of the writer's analysis of the anesthetic problem are as follows:

1. Drop ether should be to-day chosen as the standard general anesthetic when a prolonged anesthetic is desired with relaxation and unconsciousness.

2. Intrapharyngeal ether should be chosen in mouth and jaw cases when it is desirable to remove the anesthetist and the anesthetic apparatus out of the operative field.

3. Gas should be chosen in short anesthesias in which unconsciousness is desired, and in special cases, such as kidney insufficiency.

4. Local infiltration anesthesia should be chosen when the surgeon has the full cooperation of the patient and when the field of operation can be completely infiltrated and anesthetized by a safe amount of novocaine and adrenalin.

These four simple and safe methods can be made to cover all surgical cases. This places anesthesia on a very unpretentious, simple basis, but here, as in most fields of surgery, we finally learn that simplicity is near the truth.

THE MANAGEMENT OF PLACENTA PREVIA.

In the *Long Island Medical Journal* for October, 1915, BEACH recalls that abdominal Cæsarian section for placenta previa was first recommended by Lawson Tait, and to-day there are operators who use it in all of their viable cases, and others who cannot see any indication for it in any case. Its routine adoption in all cases is certainly wrong, and even though it may give better statistics for both mother and baby, its use is not warranted unless we sterilize the patient or do the Porro operation. The risk of rupture of the Cæsarian scar at a subsequent pregnancy is a thing not to be overlooked. This is a real danger, one that cannot be easily foreseen, and, after all, the Cæsarian results are not enough better to warrant such radicalism. Dorant has shown that only 32 per cent of placenta previa babies are really at term. Cæsarian section would be contraindicated if the patient had been exposed to many examinations by doctors or midwives outside the clinic, or if she had been tamponed, or showed fever. Marked previous hemorrhage, a dead or non-viable baby, and the marginal and lateral cases are all contraindications to the operation. It is essentially an operation to

save the baby, and too much risk must not be taken with the mother to save the baby. E. P. Davis is rather broad in his indications for the operation, as are also Pankow, Krönig, and Sellheim.

Abdominal Cæsarian section for placenta previa is really to-day the pivot about which all the contention is centered. That a primipara with a rigid cervix and a centralis placenta at term should have the operation, we are all agreed. The writer is willing to go a step further and believes that we will see the indication more and more broadened, until either a primipara or a multipara at or near term with a live baby and a placenta previa centralis will be the subject for a Cæsarian section, especially if the cervix seems to offer any degree whatever of dystocia. Just as we offer the border-line pelvic contractions, the chance for a live baby, so should we also when the placenta centralis is encountered.

The writer has performed one Cæsarian section for a combination of placenta previa partialis with transverse presentation and a border-line pelvis in a para II who had lost her first baby at its birth. E. P. Davis reports 17 cases with no maternal and 17 per cent fetal mortality. Pankow reports 38 cases with maternal and fetal mortalities of 2.5 per cent and 2.9 per cent respectively.

The management of placenta previa is therefore a matter of individualization and attention to detail, plus the skill of the operator with the methods at his disposal. The writer's ideas may be summed up as follows:

First, in the private house. Placenta previa with hemorrhage is best treated by either rupture of the membranes or the Braxton Hicks version, the latter being the safest procedure.

Second, in the hospital. Between the sixth and seventh months with a rigid cervix the vaginal Cæsarian is indicated. Otherwise pack for twenty-four hours and then do a bipolar version.

After the seventh month: In the marginal and lateral varieties with live baby try rupture of the membranes first, and if bleeding is not controlled introduce a bag.

In the partial and central varieties with a live baby use the bag. If the baby is dead or dying use the bipolar version. In any case after the seventh month, if the mother is weakened by the loss of blood the Braxton Hicks version is the method of choice.

In the centralis variety at or near term, with a live baby and mother in good condition, if the cervix seems to offer any degree of dystocia abdominal Cæsarian is the operation of choice.

Perforate all dead babies. Forceps should rarely be used, and only after the head has passed through the cervix. Never do an extraction either immediately or later after Braxton Hicks version. Always let the patient deliver spontaneously.

IRITIS.

In the *London Practitioner* for October, 1915, ORMOND, Ophthalmic Surgeon to Guy's Hospital, states that atropine should be used in cases of iritis until the pupil is fully dilated, or until the drug ceases to produce any further dilatation. A solution of sulphate of atropine (gr. iv in oz. i) usually produces the maximum effect, if instilled liberally at intervals. The use of the pure sulphate of atropine, in the form of crystals placed inside the conjunctival sac, does not produce any better effect than that obtained by the gradual dilatation effected by the 4 grains to the ounce solution applied over a longer period, and the latter has the advantage that it is less likely to produce toxic symptoms.

When using the solid crystals, the lacrimal duct must be kept closed by pressure. The use of atropine must be continued as long as the eye shows any inflammatory symptoms, and for absolute safety a few days longer. It is not, however, necessary to use a stronger solution than is just sufficient to keep the pupil dilated after full dilatation has been obtained. A solution of 2 grains to the ounce is usually amply sufficient for this, if instilled twice or thrice daily.

If atropine irritation ensues, the drug should be discontinued, and homatropine

and cocaine substituted. Duboisine sulphate and scopolamine hydrobromate, in one-per-cent solutions, are other mydriatics which can be used instead of atropine.

The reason for using a mydriatic in iritis is, that by it the hyperemia is diminished, and the adhesions or synechiæ between the iris and the anterior surface of the lens are broken down.

If the iritis can be traced to a definite and specific poison, the treatment will naturally be assisted materially by administering appropriate remedies for the cause; but there are cases in which a definite specific cause cannot be ascertained, so that the so-called idiopathic cases still remain. In these cases mercury is always indicated, since it is an antiseptic, and iritis always suggests the presence of a poison within the system; mercury has, too, an undoubted influence on all inflammatory conditions, whatever their cause.

Diaphoresis combined with mercurial inunction is most valuable in all syphilitic and idiopathic cases. The patient should be recommended to take three very hot baths each week just before bedtime, and to continue these for a period of three or four weeks; after the bath a drachm of the unguentum hydrargyri oleatis should be rubbed into the skin, until the ointment disappears. The patient should be warned against rubbing the ointment into the same place more than once a fortnight. The armpits, bends of elbows and knees, the groins, and small of back are all suitable places for applying the drug.

In the early stages of acute iritis, especially of the gonorrheal variety, pain is often severe. A solution of dionin, 1 to 2 per cent, combined with cocaine and adrenalin, instilled into the conjunctival sac, is very useful for this symptom. Leeches, or small blisters, applied to the temple sometimes act like magic, and hot lotions are also beneficial.

Cases of iritis, especially those occurring in men accustomed to an active independent life, often produce a very irritable condition of mind, followed by great depression, the result of the pain, partial blindness, and resultant dependence on others. To combat this, the patient should be allowed carriage exercise, and be kept as far as possible in cheerful surroundings. The photophobia is sometimes very distressing, but in no case should all light be cut off from the sick-room. Smoked glasses and a broad shade should be sufficient to protect the patient, and for the sake of the nurse and the patient's friends, as well as for his general health, the room should not be in total darkness.

All stimulants should, as far as possible, be avoided, as well as meat. The diet should be liberal, but easily digestible. Constipation must be prevented, and treatment should start with a brisk purge.

Tuberculous iritis is very chronic, and treatment must be carried out for a long time, in some cases even as long as two or three years. In intractable cases, subconjunctival injections of 1 Cc. of a one-per-cent solution of guaiacol are useful. Tuberculin should be used in all cases, but in association with general and local treatment. In gonorrheal cases, the local treatment of the urethritis should be carried out; for the pain, which is usually of a severe kind, dry heat is most satisfactory. This is best applied by means of "hot coil," which consists of a small electric resistance in the form of a flexible pad which can be bandaged on the eye so that it is possible to apply a constant dry heat for a period of half an hour or an hour two or three times a day. Leeches applied to the temple are unsurpassed as a remedy for the intense pain due to congestion, and blisters to the temple are sometimes useful. With regard to the syphilitic cases, as the writer has said before, the local treatment is generally very satisfactory; atropine acts rapidly, and usually prevents the formation of adhesions, whilst reducing those already formed. Treatment should be carried out vigorously, but the writer would not advise the use of "606" in the acute stages, for he has had one or two cases in which a severe neuroretinitis has resulted from its use. He thinks it advisable to use this very valuable remedy after the acute condition is over, and to be content with

the employment of mercury during the inflammatory stage.

In conclusion, he says that iritis is commonest in young men and adults, and that undoubtedly 75 per cent are due to venereal disease. Tubercle and infective diseases are causes which do not account for more than 25 per cent.

ACTION OF THE OPIUM ALKALOIDS, INDIVIDUALLY AND IN COMBINATION WITH EACH OTHER, ON THE RESPIRATION.

MACHT in the *Journal of Pharmacology and Experimental Therapeutics* for October, 1915, when summing up the action of the opium alkaloids on the respiratory function, states that these drugs may be broadly divided into two classes. On the one hand is morphine, which is the great sedative alkaloid, although in small doses it may not interfere with efficient respiration, and may even improve it. On the other hand there is narcotine, papaverine, narceine, thebaine, and cryptopine, which are all distinct stimulants and in large doses excitants of the respiratory center. Codeine belongs to the morphine class, though in large doses it may also excite the respiratory center, especially in rabbits.

The rate of respiration is markedly slowed by morphine, the number being on the average diminished one-third by moderate doses of the drug. Codeine also slows the respiration, but to a much less degree. Narcotine and papaverine decrease the rate but slightly; the other alkaloids not at all, and may even increase it.

The action of combinations of these alkaloids on the respiration can be completely explained as a summation of their individual properties. In this way it was found that morphine plus narcotine, morphine plus papaverine, and a mixture of the total opium alkaloids are less depressant to the respiratory center than morphine alone. This was corroborated by Hooker's method of studying the effect on the center directly, by perfusing an animal's medulla, apart from the general circulation. On the bronchi narcotine and papaverine have a dilator action, morphine and codeine also, but to a less degree, and the other alkaloids none at all; furthermore the effects of morphine and narcotine seem to neutralize or antagonize each other.

1. Of the primary opium alkaloids, morphine and to a less degree codeine are sedative or depressant, while narcotine, papaverine, narceine, thebaine, and cryptopine are stimulating to the respiratory center.

2. The action of combined opium alkaloids is a summation of their individual effects.

3. On the bronchi, narcotine and papaverine are dilators, morphine is a dilator to a less degree, codeine still less so, and the other alkaloids not at all. Morphine and narcotine seem to act antagonistically on the bronchi, their combined effect being a lesser dilatation than that produced by each of them individually.

4. It is hoped that the above findings will contribute to a more rational therapeutic use of opium and its derivatives.

STUDY OF THE NON-TUBERCULOUS INFECTIONS OF THE RESPIRATORY TRACT, WITH SPECIAL REFERENCE TO SPUTUM CULTURES AS A MEANS OF DIAGNOSIS.

In the *Archives of Internal Medicine* of October 15, 1915, LUETSCHER publishes a paper which, although diagnostic in its nature, has so important a bearing on treatment that an abstract is appropriate in a journal devoted to therapeutics.

1. Sputum cultures have been neglected because of the confusing results obtained, and the mixture of organisms found.

2. These results are due to unsuitable mediums and bacteriological methods.

3. By means of fresh blood agar plates, practically pure cultures can be obtained in 95 per cent of the acute non-tuberculous infections of the respiratory tract of adults.

4. The pneumococcus is the cause of 62.44 per cent of all the non-tuberculous infections below the larynx, and the influenza bacillus in 28.5 per cent. These two organisms cause 90.94 per cent of the infections of the bronchi and lungs; 74.96 per

cent of the infections of the larynx; and 31.29 per cent of the infections of the nose, throat, and sinuses.

5. The streptococcus, contrary to common belief and text-book reports, is only rarely the cause of infections in the lungs, and when found is usually associated with complications such as lung abscess, bronchiectasis, carcinoma, etc. In infections of the head, however, it assumes the predominant rôle, especially in the tonsils.

6. The staphylococcus aureus was never found to be the cause of the acute infections of the lungs or larynx, and only once was it found in acute coryza and acute sinusitis.

7. The micrococcus catarrhalis may cause rhinitis, laryngitis, acute bronchitis, and acute bronchopneumonia. It was found in pure culture in three out of thirty-seven cases of acute rhinitis, five out of thirty-eight cases of acute laryngitis, and in one each of acute bronchitis and primary bronchopneumonia.

8. The colon and typhoid bacillus rarely if ever produce acute lesions in the lung. The typhoid bacillus, however, may produce lung abscess following an infarct.

9. There is a unity of infection of the respiratory tree. The same organisms which cause the infections of the bronchi and lungs also cause the infections of the nose, sinuses, and larynx.

10. Sputum cultures afford an easy, quick, and reliable method of diagnosis of pulmonary infections. Since the blood cultures are negative in 70 per cent of the cases of pneumonia and negative in nearly all of the other infections of the respiratory tree, it is practically the only means of making an etiological diagnosis in the non-fatal infections.

11. This etiological diagnosis is necessary for a rational advance in prophylaxis and specific therapy. It is also a great aid in making an early diagnosis, and helps us to give an intelligent prognosis. This is especially desirable in private practice.

12. By means of these cultures we have also obtained a wider knowledge of what lesions a given organism may produce. These cultures show that each organism may produce a variety of acute lesions. Especially valuable information is afforded in that they show that influenza bacillus and pneumococcus may produce chronic lesions extending over many years. This has an especial bearing on differential diagnosis, in regard to whether or not a given chronic chest condition is tuberculous.

INTESTINAL STASIS AND INTESTINAL INTOXICATIONS: A CRITICAL REVIEW.

In the *Journal of Laboratory and Clinical Medicine* for October, 1915, WOOLLEY reaches these very wise conclusions:

1. Absorption of poisonous materials from a healthy bowel has not been shown to produce symptoms of disease.

2. Absorption of bacteria and other substances from an unhealthy bowel may produce serious symptoms.

3. A surgical operation for intestinal stasis is not justifiable except as a last resort.

4. There is no definite information in the literature to show that surgical procedures, made for intestinal stasis, have been more successful than medical (including hygienic) ones.

5. Many cases in which symptoms are attributed to intestinal stasis are suffering from focal infections entirely outside the intestinal tract. Such infections are illustrated by pyorrhœa alveolaris, chronic tonsillar infection, and chronic infections of the antra and sinuses of the head.

THE INFLUENCE OF SALICYLATES ON THE ELIMINATION OF URIC ACID AND OTHER WASTE PRODUCTS FROM THE BLOOD.

In the *Journal of Pharmacology and Experimental Therapeutics* for October, 1915, DENIS concludes that sodium salicylate and aspirin administered in the large doses frequently used in the treatment of acute rheumatic fever cause the uric acid content of the blood to be markedly reduced, a result which up to the present time has been shown for only one other drug—*i.e.*, phenylquinolin

carbonic acid (atophan). Most of the patients used in the work had blood giving non-protein nitrogen values but little above normal; in these the administration of salicylate had no effect on this fraction. In two or three cases, however, the non-protein nitrogen was abnormally high, and in these cases a considerable diminution of the fraction took place after the administration of the drug.

In the three cases in which large doses (7 grammes) of sodium salicylate were given for one day only, one showed no change in the uric acid content of the blood, while the other two showed a reduction comparable in size to that obtained in the first eight cases in which medication was continued for three days, a result similar to that obtained by Fine and Chace by means of atophan.

The smaller doses of sodium salicylate used in two experiments were apparently without much effect in producing either an increased output of uric acid in the urine or a decreased content in the blood.

From the few cases in which the writer has been able to obtain a third sample of blood some days after the administration of salicylate had been stopped it would seem that as soon as the drug is withdrawn the accumulation of waste products recommences, a finding which is in accord with the long-known fact that after the administration of salicylate is discontinued the output of uric acid in the urine is frequently diminished below the level at which it stood previous to giving the drug.

From the foregoing results the increased output of uric acid following salicylate medication is clearly due to a lowered threshold value of the kidney, not only for uric acid, but in all probability for other waste products as well. Such being the case, it may well be that the beneficial effects resulting from the use of salicylates in acute rheumatic fever may, in part at least, be due to a power possessed by this class of drugs of increasing kidney permeability, thereby facilitating the rapid and more or less complete excretion of the as yet unknown toxins which produce symptoms of these diseases.

THE TREATMENT OF CEREBROSPINAL SYPHILIS BY MERCURIALIZED SERUM.

The resistance of tabes, tabo-paralysis, and general paralysis to antisyphilitic treatment has long been the despair of the syphilologist and the neurologist. It is true that in cases which are not too far advanced some improvement occasionally occurs after intense mercurial treatment, but the great majority of cases are not amenable to antisyphilitic drugs when administered by any of the ordinary routes; indeed, some authorities have stated that these conditions are made worse by such treatment. Tabes, tabo-paralysis, and general paralysis were therefore regarded as parasyphilitic affections, and, although syphilitic in origin, beyond the scope of antisyphilitic treatment.

The discovery by Noguchi and others of the Spirochæta pallida, in its typical form, in the brain of general paralytics and in the spinal cord of tabetics threw a new light on the pathology of these affections and gave cause for hope for further success in treatment. It appears that they must now be regarded as cases of true cerebrospinal syphilis and not parasyphilis. Mott introduced the term "parenchymatous syphilis" to distinguish them from cerebrospinal syphilis of vascular origin. To explain the failure of mercury and arsenic to influence parenchymatous syphilis, when introduced by the usual routes, it has been suggested that the cells covering the choroid plexus exercise a selective action and do not allow these drugs to pass from the general circulation to the cerebrospinal fluid. The method of direct intraspinal treatment introduced by Marinesco was founded on this hypothesis. Both a dilute solution of neosalvarsan and serum taken from a patient after intravenous injection of salvarsan or neosalvarsan have been used. The latter method is assumed to depend on the presence of antibodies in the serum, produced by the preliminary intravenous injection of salvarsan, since the amount of original or altered salvarsan present in the quantity used for intraspinal injection must be infinitesimal. Owing to the irritation caused

by direct injection of the arsenical preparations treatment by "salvarsanized serum" has obtained most support. Swift and Ellis, of New York, in 1912, tried this method in cases of tabes, and the following year Robertson of Edinburgh used it in general paralysis. Since then intracranial injections have been tried in general paralysis.

The results of treatment by salvarsanized serum in parenchymatous syphilis are doubtful, although temporary improvement has been reported by several observers. The question naturally arises whether better results could not be obtained from the use of intraspinal injections of mercurialized serum or some preparation of mercury. This question has recently been studied by C. M. Byrnes, of the Johns Hopkins University, who, after a year's unsatisfactory experience with salvarsanized serum, has devised a method of treatment by what he terms "mercurialized serum." In the preparation of this serum Byrnes employs albuminate of mercury, for the reason that this is the form in which mercury is supposed to exist in the blood after ordinary mercurial treatment. When an inorganic salt of mercury comes into contact with albumin, coagulation occurs with the formation of albuminate of mercury. This is soluble in excess of albumin, so that the addition of more serum forms a clear solution. It was found that approximately 0.02 gramme of mercuric chloride solution added to 2 Cc. of serum caused complete precipitation, and that 4 Cc. of serum was required to dissolve the precipitate. Thus 6 Cc. of serum will hold 0.02 gramme (1/3 grain) of mercuric chloride converted to albuminate in solution, a larger quantity than is required for therapeutic purposes. After experimenting with very small doses, Byrnes found that 0.0013 gramme (1/50 grain) or even 0.0026 gramme (1/25 grain) could be given safely. The technique is as follows: (1) Sufficient blood is withdrawn to yield from 12 to 30 Cc. of serum; this is centrifuged and the serum removed; (2) 1 Cc. of a solution of mercuric chloride in distilled water, made to contain 0.0013 gramme to 1 Cc., is added to 12 Cc. of serum; (3) to the serum thus prepared is added salt solution up to 30 Cc., if diluted serum is to be used; if a concentrated solution is required this is omitted; (4) the mercurialized serum is heated to 56° C. for half an hour; (5) lumbar puncture is performed with the patient in bed; pressure readings are taken, and the spinal fluid withdrawn till the pressure falls to 30 mm. The serum is then administered by gravity at body temperature, and the foot of the bed raised.

Byrnes has used this method in 32 cases, comprising 13 of tabes, 14 of general paralysis, 2 of tabo-paralysis, and 3 of cerebrospinal syphilitic meningitis. In tabes there was improvement in the gait and also in the gastric and bladder symptoms. Some cases of general paralysis were also improved, and in one case of tabo-paralysis the grandiose ideas are said to have disappeared, and the mental state of the patient to have become apparently normal. Favorable results were obtained in the cases of meningitis. The diminution in cell elements of the cerebrospinal fluid was more rapid than after treatment by salvarsanized serum.

It will be noted that Byrnes's method by "mercurialized serum" differs from that by "salvarsanized serum" in that it consists of direct treatment by means of a preparation of mercury dissolved in serum, instead of indirect treatment by serum containing hypothetical antibodies. In this respect it would appear to be the more rational form of treatment, for the quantity of mercury present in serum withdrawn from a patient after intense mercurial treatment has been found to be quite insignificant, and the amount of antibodies present in such serum must be problematical. It also has the advantage of being a simpler procedure, since it avoids the preliminary intravenous injection required for salvarsanized serum.

The introduction of mercury into the subdural space had been previously tried by Ravaut, who used the perchloride and the cyanide in two cases, but the results were disappointing. This led Byrnes to seek for a non-irritating preparation similar to that in which mercury circulates in the blood (albuminate). In the usual doses this form

of mercury was found to be quite as powerful as the inorganic preparations, and it has since been used for intravenous injection in ordinary cases of syphilis by L. Thompson, who regards it as a useful method when rapid results are required. The initial dose given in his cases corresponds to 1/12 grain of mercuric chloride, and this was increased to 1/3 grain. Further results of this form of mercurial treatment will be awaited with interest.—*British Medical Journal,* Sept. 25, 1915.

CARDIOVASCULAR-RENAL DISEASE (ARTERIOSCLEROSIS).

BISHOP, in the *Medical Record* of Oct. 9, 1915, states that it is his experience that practically all well-advanced cardiovascular-renal sufferers are sensitive to meat proteins, that nearly all are sensitive to fish proteins, and that a large part are sensitive to egg proteins. The single exception seems to be with the flesh of fowl, which is tolerated by many who cannot tolerate meat or fish. [We would like to have the reasons for such a view.—ED.]

In the presence of severe disease all eggs, fish, meat, and stock soups should be excluded. This leaves a much wider dietary than would at first be supposed.

After disposing of the supposed gastric origin and the uric-acid origin of the disease, there are still practically all the fruits, vegetables, cereals, fats and oils, with every kind of milk product. Exclude only things which the individual finds from actual and repeated experience to disagree with his stomach.

Alcohol is not specifically harmful, though its side effects are unfriendly to any systematic hygienic treatment.

Tobacco is a matter of individuality. A few people are profoundly sensitive as to their cardiovascular system to tobacco. Most people can use it in moderation.

The second indication of treatment, founded on the belief that all these examples of degenerative circulatory disease are in their ultimate analysis examples of chronic food poisoning, is attention to the intestinal tract, particularly as to the elimination of stagnating material. For this purpose the good and tried remedy, castor oil, is so much better than any other that the writer uses it almost exclusively, and as nearly as possible in its pure form.

In starting treatment of a person with cardiac pain, high blood-pressure, and albuminuria, he gives a full ounce of castor oil every other day for three days, then at the end of a week, then in two weeks, then in three weeks, and follows this by a monthly dose as the rule for a long period of time.

The third element in treatment of the disturbance of metabolism that is the underlying cause of cardiovascular-renal disease is found in exercise. Exercise constitutes the best cardiac stimulant, the best pulmonary excitant, and the best remedy for intestinal inactivity. The writer is accustomed to tell people with high blood-pressure that bodily fatigue judiciously obtained out-of-doors is the best antidote for that condition.

To sum up his conception of the nature and treatment of cardiovascular-renal disease it may be said that we must seek the underlying cause of the disease in the ultimate cell. We must regard the organic changes as the result of the progress—not as the disease itself.

In treatment we must primarily treat the disturbed metabolism by cutting off the source of irritation in proteins to which the individual is sensitive, by a diet to which the writer has given the name "the few-protein diet," because it implies the complete elimination of irritating proteins rather than the diminution of their quantity, the recognition of exercise as the best cellular and organic stimulant, and the use of castor oil as the best single remedy.

In addition to these things we will bring to bear on the treatment of the individual organs such methods as are needed and as our judgment dictates.

Space does not permit of the discussion of the place of iodide of potassium, nitroglycerin, digitalis, hydrotherapy, and many other implements of the art of medicine that are appropriate.

The great enemy of the cardiovascular-renal patient is the supposed specific,

whether it be electricity, radium, some fantastic combination of salts, or the latest fashionable combination of iodine. The road to restored health is rugged and beset with discouragements, but the comfortable byway offered by the supposed specific has led to the subtraction of many years of life from persons who have been so unfortunate as to rely on them to the neglect of essentials of treatment.

The cure resort, as exemplified by the cures of Europe and now by our own Saratoga, makes the strict regimen much pleasanter to carry out, though many cures are constantly being successfully conducted by people in their own homes. The sufferer from cardiovascular-renal disease is often the most valuable citizen in his community, and much more worth saving than those liable to succumb to infectious diseases.

TREATMENT OF RHEUMATISM.

MACRAE SMITH in *Northwest Medicine* for October, 1915, says that as the principal characteristic of rheumatism is the arthritis, some local application must be found which may be rubbed in. This gives a certain amount of physical relief to the patient and an equal amount of mental relief to his friends. For this purpose the writer finds that oil of wintergreen, either pure or as a liniment or ointment, gives considerable help. Menthol and belladonna are not quite so useful. Rest to the joint gives the greatest amount of relief. This may be obtained by wrapping it well in cotton and using a splint, or by applying a light plaster-of-Paris cast.

The writer had not thought of the value of a plaster cast until he read a few years ago a paper by Dr. Rich of Tacoma, Washington, describing the advantage of this line of treatment. Subsequently the writer tried it a number of times and found it most efficacious in relieving pain, owing to the limitation of movement and prevention of jars. It is best applied by wrapping the joint well in cotton, putting on the cast and splitting it. Then no increase in swelling causes harm or pain from pressure. This can be left on a few days, but must not be permitted to remain too long; if left there during the chronic stage it is possible to obtain permanent stiffness and even ankylosis.

It is from internal medication, however, that the greatest relief is obtained, and this is so constant in the case of salts of salicylic acid that they may almost be termed specific in their action. For this purpose it is best, the writer believes, to use the natural acid, although many affirm there is no difference. It must be given in large doses at first—that is, 15 to 20 grains every four hours. He usually combines it with some pepsin preparation in order to lessen the irritation of the stomach. It may be combined with soda bicarbonate, but the writer prefers to give any alkali entirely separate in the form of potassium acetate, gr. xv t.i.d., until the urine becomes highly alkaline. This dose of salicylic acid or sodium salicylate he continues until the pain is gone or the ears begin to ring, when he cuts the dose in two and usually finds that sufficient. If the salicylate be continued it may produce deafness and some of the cutaneous irritations. In the ordinary case he gradually tapers off the dose. During the whole course of the disease special attention must be paid to the bowels, and for this purpose the salines are of the greatest service—Epsom or Rochelle salts, or any of the aperient waters, may be used. Care must be taken, however, not to weaken the patient by purgation.

If the disease be a mild one, we may hope for cure in about three weeks. Relapses unfortunately are frequent. It may be found necessary to use massage for the affected joints and to rub them with stimulating liniments, and, if they remain obstinate, blisters, counter-irritation of various kinds, and even the application of dry heat, raising the temperature to some 400° F., in an effort to produce free movement.

The internal administration of potassium iodide is of the greatest help in these chronic cases, either alone or combined with the salicylates. For the severe pain aspirin will be found to give more relief than any of the other forms of the drug, but must be given

in large doses. Many advise much larger doses than the writer would care to give, for while he gives 5 grains and usually combines it with an equal amount of phenacetine, we may give ten, fifteen, and even twenty grains. Aspirin is a little less irritating to the stomach than salicylic acid, and a little more irritating than salol.

As soon as the fever goes the writer begins the use of iron, preferably Blaud's mass, and continues it long after the arthritis has completely disappeared. He considers this one of the most important parts of the treatment. It lessens the danger of relapse and also counteracts the tendency to cardiac complication by increasing the general resistance. Arsenic in the form of Fowler's solution may be used, especially if there be any tendency to a choreic complication; in the ordinary case, however, he rarely uses it. Quinine is of value, but mostly as a general tonic, and is used in small dose. Cod-liver oil is one of the very best medicines in the chronic stage, and in such cases is of more value even than iron. He would continue it for a long time, sufficiently long to improve the patient's general health markedly.

PERMANENT BRADYCARDIA AND ATROPINE.

The *British Medical Journal* of September 25, 1915, states that E. COTTIN (*Archives des maladies du coeur, des vaisseaux, et du sang,* June, 1915) describes two cases of bradycardia—one of organic, the other of nervous origin. The second case is of much interest in view of the fact that up to quite recently it was generally held that true bradycardia of nervous origin was always paroxysmal, never permanent. The first case presented no very special features. The patient was a man seventy-two years of age, suffering from cancer of the stomach. The pulse-rate varied between 38 and 40 per minute, and was regular. A series of tracings were taken. The auricles contracted at the rate of 85 a minute, and all relation between the contractions of auricles and ventricles was broken. Atropine had no effect upon the contractions of the ventricles, nor indeed upon those of the auricles. The absence of effect upon the auricles diminishes the value of the atropine test, but the same phenomenon has been observed by other workers, and in this it may have been concerned with the advanced age of the patient. At the autopsy the auriculoventricular bundle of His was found to be completely invaded by a dense sclerous tissue, and, in addition, a small calcareous area was found at the level of the auricular origin of the ventriculoauricular bundle.

The other patient was a woman thirty-four years of age, who, since the age of nineteen, had been subject to so-called nervous crises. From about the same age also a gradual progressive enlargement of the thyroid gland had been observed. The slow pulse-rate was first noticed when she was twenty-six years of age. At that time the pulse-rate was found to vary between 45 and 55 per minute. Four years later she came under the care of Professor Bard. The pulse-rate was now between 45 and 50; from time to time an extra-systole occurred, and at times extra-systoles were frequent. The heart was not hypertrophied. The upright position, movements, and quick walking had a hardly perceptible and very transitory effect in quickening the pulse-rate. The venous pulse was very apparent, especially in the left jugular vein; sometimes there were three to four rises of the jugular vein to each cardiac contraction, sometimes there were small rises during the ventricular pause, and sometimes a sharp rise due to the simultaneous production of both contractions. At first sight the case appeared to be one of total auriculoventricular block, but careful examination of the two tracings taken at this period showed that the block was incomplete. In one tracing there was a ventricular response to all the auricular contractions. In the second, taken a few minutes later, the ventricular beat was at the rate of 38 a minute, the auricular about 85. The rise S of the venous pulse was each time preceded by a wave P, so that the ventricular contraction was provoked by an auricular contraction, but, in addition, small rises were observed, which corresponded to auricular contractions without any ventricu-

lar response, and at one time there was a sharp rise consequent upon the superposition of the auricular on the ventricular contraction. The interval of transmission, P-S, was very irregular in both tracings, and in one was found to increase from one cardiac revolution to another, until a length of twenty-six-fiftieths of a second was reached instead of the normal ten-fiftieths, thus showing a disturbance of conductivity. One of the tracings showed the presence of extrasystoles not followed by a compensating rest, a condition of things which Galleverdin considers to occur only in cases of total block, but which in this case occurred during the period of incomplete dissociation only. At this time the patient suffered from attacks of vertigo and semisyncopal attacks. Later, as in most cases of bradycardia, especially those of cardiogenic origin, the disease entered upon a second phase, in which tracings showed the dissociation to be complete and permanent. The syncopal attacks still persisted, but became slightly less frequent, were of longer duration, and were accompanied by total loss of consciousness. During this stage tracings were taken a few minutes and forty-five minutes respectively after the injection of 2 mg. of atropine sulphate. In the first tracing the ventricle was beating at the rate of 38, the auricle at 93, and the independence between the two cavities of the heart was evident and complete. In the tracing taken after forty-five minutes no sign of block remained. The rate of contraction of both auricle and ventricle was 85; the interval P-S had become uniform and did not exceed the normal length. The effect of atropine was the more striking since movements, walking, fever, all of them causes which lead, as a rule, to quickening of the pulse, had always been without marked influence on the heart rhythm.

In this case the bradycardia was undoubtedly of nervous origin, but it is not easy to localize the nervous lesion. The author is inclined to attribute it to excitation of the pneumogastric nerve, possibly due to pressure, direct or indirect, by the goitre from which the patient had suffered for years. Extirpation of the goitre would have decided the point, but the patient energetically refused any kind of surgical intervention.

OBSERVATIONS ON THE USE OF PITUITARY EXTRACT.

In the *Medical Record* of October 9, 1915, BANDLER recalls that when an extract of the pituitary gland is injected during labor it stimulates uterine contractions, increasing all the various powers of the uterus to such a degree that we have a perfect right to say that the secretion of this gland is responsible for labor. This secretion, injected before labor has begun, has little influence except to produce a painless contraction. What new relation between the various glands occurs just before labor, or what inhibitory influence is released, or what new secretion is introduced, is as yet not definitely known.

When we inject pituitary extract, we are injecting a secretion normal to the body. When we inject it during labor, let us take it for granted that we are simply increasing the amount of this secretion, and hence simply bringing its activity up to the maximum that is available. The most that it does is to make the uterus behave as in the typical normal forms of labor. It makes the uterine contractions effective. The patient has pain, the usual amount of pain is often increased, but the patient has genuinely valuable uterine activity. There is no toxic effect. There is no injurious influence on the patient's general systemic state.

The drug is put up in ampoules. A hypodermic of a complete ampoule produces a too forcible uterine contraction. A third or half an ampoule is sufficient at any one time. The effect wears off at the end of half an hour. If a patient in the preliminary stages has regular or irregular pains or discomforts, and is actually in the first stage of labor, even though it be extremely sluggish, injections of pituitary extract prove them to be real labor preliminaries by changing them to regular forceful rhythmic contractions.

Now with these facts before us it is a very simple thing to decide as to the value

of pituitary extract, when it should be used, and how it should be used. The writer puts the statement in a few words. Whenever at any stage of labor progress is slow (when conditions are normal), whenever labor pains are ineffectual (when conditions are normal), whenever labor pains become sluggish, or cease, or uterine atony supervenes (when conditions are normal), pituitary extract, in single or frequently repeated doses, makes the case behave like a normally progressing labor.

Now, what is meant by the statement, "When conditions are normal?" By this is meant that the position and the presentation and the relation between the fetal parts and the bony pelvis are such that a live baby may be expected with a fair degree of certainty.

In the first stage in primiparæ the head must be firmly engaged in and through the brim, and the head must be well molded. If the first stage proceeds too slowly under such conditions pituitary extract is indicated. After the cervix is completely dilated and the membranes are ruptured, and the well-molded head is through the brim, pituitary extract may and should be given when progress is slow. These observations are directed particularly to the labor in a primigravida. In the third stage pituitary extract aids in the expulsion of the placenta, although for this purpose the writer is accustomed to use ergot and the Credé method.

In discussing the first stages of labor, the attention of most men is fixed upon the elements of dilatation of the cervix. Very little stress is laid upon the fact that the head must be firmly engaged in the brim and must be gradually molded so that it may make its way through the bony inlet. If the head is molded, after being firmly engaged, as labor pains continue, the element of dilatation of the cervix itself can more readily be controlled than if the reverse were the case. We are here confronted with a condition very much like that in dry labor, where the molding of the head and its gradual propulsion by the uterine contractions serve to dilate the cervix even more slowly than were the membranes still intact. Hence, an all-important factor in the use of pituitary extract is that we must be sure of our proportions. We must be sure that the head is fixed and molded, and can pass through the brim without very great effort. If this is the case, and if then the cervix dilates slowly, or the further propulsion of the head goes on too slowly, the use of pituitrin in small doses will exert the most marked hastening effect upon the progress of the labor.

Pituitrin is very much the same as gasoline to an automobile. The more steadily we feed the automobile with the least amount essential to each speed, the greater is the effect. Pituitary extract, granted that all other conditions are normal, will aid the first stage, and will benefit markedly the propulsion of the second stage in primigravidæ. In multiparæ the effect is most remarkable in many cases, even when the head is not engaged in the brim, when the previous history shows that labor had progressed normally, and when there is no disproportion between head and pelvic bones. Labor is not infrequently completed; that means dilatation of the cervix, rupture of the membranes, expulsion of the child, in fifteen minutes after the first or second injection of pituitary extract.

In women who have already had children, and in whom there are no bony malformations, the writer uses pituitary extract as soon as well-recognized labor pains are present, and if the pains are irregular and not definitely diagnosed as true labor pains, pituitary extract is used to make this diagnosis. Bandler's experience has been that in multiparæ, with the aid of pituitary extract, the average duration of labor is two hours after he has reached the bedside.

Now, what has pituitary extract done for the obstetrician who uses it in the way the writer has mentioned above?

It has given him the opportunity of determining whether the so-called false labor pains are false or true ones, and they are often true ones. It has enabled him to shorten the duration of labor in primigravidæ and in multiparæ to a most decided

degree. It has cut down the need for the application of forceps to such a degree that their use is scarcely ever indicated except in emergencies. It has almost entirely removed from the field of consideration long and protracted labors due to uterine inertia (emphasis on "due to uterine inertia"). It has given a much greater degree of certainty against the probable or possible occurrence of postpartum hemorrhage.

Let the writer say a few words about Cæsarian section. As soon as the incision in the abdominal wall is begun the patient receives a hypodermic of pituitary extract, one ampoule. As a result, as soon as the fetus and placenta and membranes are delivered the uterus contracts so decidedly that the sewing is readily accomplished, the loss of blood from the wound surfaces is absolutely *nil*, and the bleeding from the uterine lining is remarkably slight. He repeats these hypodermics in similar doses for several days after the operation.

In abortions and miscarriages pituitary extract has no wonderful action in contracting the uterus, and the writer does not rely upon it entirely, using it and ergot alternately during the curettage or the emptying of the uterus. He uses both alternately to secure a proper involution after emptying of the uterus. With the ovum still intact, he relies on the packing of the uterus and vagina, and then uses pituitary extract and ergot alternately.

Of what value is pituitary extract to the gynecologist?

The writer has used this drug in a large number of cases of menorrhagia and metrorrhagia not dependent upon growths or overgrowths in the uterus. He has given one ampoule daily, or on alternate days, for weeks at a time, and has rarely failed to benefit the patient.

The Dührssen operation is not infrequently followed by a tendency to menorrhagia, due in all probability to congestion. These patients are almost of a certainty relieved of their annoyance by the aforementioned use of pituitary extract.

There is no form of uterine bleeding, except that due to carcinoma, in which the continued use of medication for six or eight weeks can in any way be productive of harm.

Pituitary extract is supposedly a powerful stimulator of peristalsis, and the writer has many, many times seen it work wonderfully in postoperative and postpartum cases. In two instances where catheterization was needed at intervals in patients not in the postoperative or postpartum stage, the repeated daily use of pituitary extract has aided markedly in the restoration to the normal.

Some patients are a little sensitive to this drug, a slight pallor of the face and a little coldness of the extremities resulting, which wear off at the end of fifteen minutes; their occurrence is by no means the rule, but rather the exception. In the obstetric cases the writer has never seen even this annoyance.

MUCOUS COLITIS.

In *American Medicine* for October, 1915, BASTEDO says the treatment must be preventive and symptomatic. It is directed toward the prevention of the accumulation of mucus, and to the removal of the associated conditions, such as colic, constipation, intestinal toxemia, disturbed stomach conditions, flatulence, and depressed general health. He takes up first the treatment of the abdominal pain or colic, and then the treatment of the condition after the attack of colic or when there is no colic.

The treatment for the attack of colic resolves itself into measures to relieve pain and neurotic symptoms, and measures to promote evacuation of the mucus.

The first of these is attained by rest in bed, a large dose of bromide by mouth, one or more hypodermics of atropine sulphate gr. 1/50 and codeine sulphate gr. ½, and hot applications to the abdomen in the form of hot-water bag, poultice or stupe, or a hot bath. On account of habit formation in neurotic subjects, morphine should not ordinarily be employed, but it may be where the recurrence is not frequent and the attack is very severe. The best single drug is atropine.

For the evacuation one may use a large dose of castor oil by mouth, or colonic lavage with normal saline, or a solution of sodium bicarbonate one drachm to one pint, given warm and at low pressure (two feet). It may be impossible to get this up into the colon at first on account of the spasticity, but persistence may result in success, and the result is worth trying for. Irritants should not be employed in the already highly sensitive colon. The castor oil acts by making vigorous peristalsis. This coming from above the mucus tends to separate the mucus from above downward, and to carry it onward past the site of the spasmodic obstruction. With the passage of the peristaltic wave the obstruction spasm is abolished.

After these evacuating measures, or in lieu of them in some cases, it is wise to inject slowly into the colon one-half to one pint of olive or cottonseed oil, to be retained over night. To aid this a towel may be placed over the anus. Often the combination of castor oil by mouth, codeine and atropine hypodermically, and the olive oil injection will result in a deep sleep, with the passage a few hours later of the oil and abundance of mucus, and complete relief with no recurrence for a long time.

The treatment after the attack or in cases without colic is designed to prevent accumulation of mucus, to overcome constipation and intestinal toxemia, and to improve general health.

To prevent accumulation of mucus, one of the best remedies is castor oil once or twice a week, and this may be supplemented by colonic lavage every day for a week, every two or three days for two or three weeks, or longer if deemed necessary, or once a week for long periods of time. For colonic lavage the patient should be on the back, or in refractory cases in the knee-elbow position, to allow the fluid to reach the cecum. Some time preceding the lavage he should have emptied the bowels, as the starting up of the defecation reflexes will prevent proper lavage. The liquid used may be tap water, saline, or sodium bicarbonate one drachm to two pints, of course sterilized (sodium bicarbonate is changed to carbonate by heat). If the mucus is not loosened at the time of the irrigation it may be passed one or several hours later. The writer always considers that an irrigation is a failure if no water is retained to be evacuated later or if the water returns clear at the outset, for obviously in such cases the liquid has failed to get past the descending colon or sigmoid.

To lessen the mucus production, he has tried belladonna or atropine for many days at a time, but without avail. To promote its production, in the hope that this would prevent its desiccation and favor its expulsion, he has tried ipecac, also without avail.

The treatment of the constipation and intestinal toxemia is that of any form of constipation. There should be insistence on a daily movement of the bowels, but restriction of the use of enemata and colon irrigations. The writer has had patients who came to think that any abnormal sensation could be removed only by enema or irrigation, and acquired the habit of using these several times a day. If there is ptosis of the abdominal viscera, or laxity of the abdomino-pelvic walls (and these are exceedingly common), the patient should wear an inelastic binder for mechanical muscles. The writer has called attention to these in an article entitled "Simple Measures in the Treatment of Chronic Intestinal Stasis," *International Journal of Surgery*, April, 1914.

The diet may have to be modified according to the condition of the stomach and upper bowel (achylia, hyperchlorhydria, duodenal ulcer, etc.), but in general at the outset it should be the bland lacto-farinaceous type. Later there may be a gradual transition to a coarser type with much vegetable and fruit. But there should be at all times limitation in the amount of readily putrefactive proteins, as in animal flesh, eggs, beans, peas, and lentils, these being replaced, if possible, by much milk in the dietary. The coarse diet at the outset, as advocated by von Noorden, is likely to give rise to gastric disturbances, particularly flatulence, and it is to be remembered that

an excessive quantity of coarse, indigestible food will do more damage to a sensitive intestine than any mild laxative. Moreover, in a large number of cases there is real inflammation, and this is best treated by the bland diet. But the diet should be ample, and its quantity insisted upon, for these patients are prone to undereat because of a suspicion that this, that, or the other article of food does not agree with them.

The best laxative in these cases is probably liquid paraffin, but this may require to be supplemented with phenolphthalein, cascara, or an aloin, belladonna and strychnine pill each night. Cascara may gripe because of the spastic bowel. Agar-agar may be useful in some cases, but may form too good a medium for the bacterial growth. Salines may be employed for a short time, but not indefinitely as they make an entirely abnormal stool. Drastics should be avoided. Calomel or blue pill is not contraindicated and may be useful as a weekly or occasional dose. The writer has already spoken of the use of castor oil weekly or semiweekly and the colon lavage. Hemorrhoids are a bad complication, as they prevent the use of either castor oil or lavage.

A measure of great value, especially if there is chronic colitis, is the retention of eight to sixteen ounces of olive, cottonseed, or mineral oil over night, every night for a month, a piece of rubber sheeting being placed on the bed and a folded napkin over the anus to avoid mishap. A capsule much in favor and apparently of value is that containing castor oil from 2½ to 10 minims with salol 2½ to 5 grains, given four times a day.

If there is any definite surgical condition in the abdomen such as appendicitis, or cholelithiasis, adhesions, kinks, bands, these should be corrected. In sixty-six cases Mummery found surgical conditions as follows: in 14 adhesions causing kinks or obstructions, in 5 chronic appendicitis, in 2 inflammation of appendages or displacement of uterus, in 7 cancer, in 1 stricture of sigmoid. In persistent cases the bowel itself may have to be treated by surgical measures, viz.: (1) For cleansing and medicating the colon, an artificial opening such as by appendicostomy or cecostomy, for the purpose of permitting daily irrigations through the opening. These must be continued for from six months to two years (Mummery), and the procedure is not, in the author's opinion, a valuable one. (2). For overcoming stasis, such as plication of the cecum, fixation of movable cecum, ileosigmoidostomy, cecosigmoidostomy, partial colectomy, and complete colectomy. The indications for radical surgery and the choice of surgical procedure the writer will not attempt to discuss here.

CHENOPODIUM IN THE TREATMENT OF UNCINARIASIS.

In the *Journal of the American Medical Association* of November 6, 1915, BISHOP and BROSIUS reach these conclusions:

1. The method of administration of chenopodium is simple, and is attended with less inconvenience and discomfort than is thymol. This would give the drug an important place in the field work in uncinariasis.

2. Chenopodium can be given at shorter intervals than can thymol, and a cure can thereby be more quickly established, which gives it a greater economic value.

3. Chenopodium is non-toxic in therapeutic doses.

4. Chenopodium is a more efficient vermifuge than thymol in the treatment of uncinariasis.

HISTOLOGICAL CHANGES IN ARSENIC KIDNEYS.

In the *Journal of Experimental Medicine* of November 1, 1915, PEARCE and BROWN as the result of a research reach these conclusions:

1. The type of renal lesion produced by compounds of arsenic varies widely; while some arsenicals produce changes in which vascular injury predominates, others produce an equally dominant tubular injury.

2. In either of these groups the character and degree of the vascular or tubular injury produced by different compounds show further variation, so that the lesions of differ-

ent arsenicals of the same group are not identical. Each compound of arsenic tested, therefore, produces a lesion-complex in the kidney that is relatively characteristic for that compound.

3. The mode and character of the action of arsenicals are dependent upon the chemical constitution of the compound.

PSEUDOCOXALGIA.

LITTLE (*Clinical Journal,* Nov. 10, 1915) after citing the symptoms of this affection, which are practically identical with those of tuberculous hip disease, notes that the most striking characteristic is revealed only by the *x*-rays, since no one in this country is likely to emulate a German surgeon who in such a condition excised the head of the femur and thus secured an interesting and instructive specimen. In a typical case the upper part of the bony nucleus of the femoral head is shown as a flat surface. Light spots are seen on the head, representing parts more pervious to the rays than the rest of it, or the bony nucleus may even be divided into two or more portions. The neck shows an irregular permeability. The epiphyseal line between head and neck is irregular. Probably these light spots are due to islets of cartilage, such as were found in the only specimen of which an account has been published. The process is a chronic one, lasting for two or three years or even more, by the end of which time the patient has lost his limp, but may be left with some shortening, and some reduction of the range of abduction and of rotation.

The affection is almost always unilateral. There is no knowledge as to etiology, though hypothyroidism is suggested. As to treatment it seems at least desirable to attempt to abduct the thigh and keep it in marked abduction, so that the head of the femur may not take a form, as growth proceeds, which would prevent this movement, when the active disorder is at an end. Therefore as soon as diagnosis is made the thigh should be abducted under anesthesia and fixed in that position by means of plaster of Paris. With a patten or high boot the child on the other foot is encouraged to move about freely. A typical history is that a child between the ages of three and twelve years, apparently in perfect health, begins to limp and perhaps complains of some pain, which, however, is never severe. These symptoms are not very marked, but on examination more characteristic ones are found. Flexion and extension of the thigh on the pelvis are free and painless, but the range of the movement of rotation, especially inwards, is much below the normal, and abduction is well-nigh impossible, except under an anesthetic.

In short, the movements of the joint, which in health are those of a ball and socket, are found to be reduced to those of a simple hinge-joint, such as the elbow.

The lower limbs are equal in length at first, but later there may be some shortening. There is little or no tenderness on palpation of the region of the hip-joint and no tumefaction, but generally it is noted that the great trochanter on the affected side is unduly prominent. This appearance is probably due to slight wasting of the muscles on the affected side, which is a common symptom. The Trendelenburg sign is usually found. This consists in the drooping of the sound side of the pelvis when the patient stands on the foot of the affected side, holding the foot of the sound limb off the ground. In a normal child the buttock will be seen not to drop, but in congenital dislocation of the hip and some other conditions the abductors of the thigh are unable to hold up the pelvis.

Von Pirquet's or other tests for tuberculosis give negative results, unless, of course, there is or has been some tuberculous focus in another part of the body.

Coxa vara must be distinguished from pseudocoxalgia, as must cystic disease of the neck of the femur and congenital dislocation of the hip. The *x*-ray affords the easiest, shortest, and most prompt way of making the diagnosis. Arthritis deformans juvenitis is characterized by pain and a loss of movement in all directions and resultant deformity.

OPERATIVE TREATMENT OF EDEMA AND VARICES OF THE LOWER EXTREMITIES.

D'ORIA (*International Journal of Surgery*, November, 1915) observes that the most frequent seat of thrombosis is the common femoral vein. Up to 1910, 95 patients had been subjected to the Madelung operation, with only about eight recurrences during six months' observation. Simple section of the vein, performed 33 times, gave 30 per cent recurrences during four to ten years' observation; partial saphenectomy, 20 per cent recurrences in 21 cases during four to eight years' observation. Moreschi's operation in eleven cases gave two recurrences during six years' observation.

None of these operative procedures are indicated for thrombotic varices due to typhoid endophlebitis. The superficial venous dilatation in such cases represents channels purposely created by nature through laws of compensation, and should therefore be respected. Biondi operates by interrupting the main arterial current, resecting between two ligatures a small portion of the superficial artery, not disturbing the venous circulation either superficially or deeply. This arterectomy establishes a circulatory equilibrium by interrupting the current in the main artery of the limb, just as the obliterating thrombus had done in the vein.

Two cases are reported, both of a septic phlebitis, followed by chronic edema of the extremities with ulceration, both promptly cured by excision of a section of the artery.

DIRECT TRANSFUSION OF BLOOD.

LESPINASSE (*Chicago Medical Recorder*, October, 1915) notes that there are two chief advantages in using the "iridio platinum tubes," namely: (1) The full lumina of the vessels are maintained; (2) "iridio platinum" is so hard and takes such a high polish that there is no chance for the blood to adhere to it and so clot. The wall of the tube is very thin, 2/1000 of an inch, so that when it is inserted into the blood-vessel there is no diminution in the blood-vessel lumen, consequently the time necessary for transfusion is shortened, and also there is no stagnant pool of blood behind the thick wall of the tube to start a clot. The preservation of the full lumen of the blood-vessel in the tube is a very important factor. At best the radial artery is small, averaging about 2 to 2½ mm. in diameter. If one-half the lumen of the artery is taken up by the walls of the tube inserted into its lumen, the blood flow will be diminished by four, and it will take four times as long to transfuse a given amount of blood.

The radial artery of the donor is dissected out under local anesthesia for about an inch, the small branches are double clamped and double ligated. As the blood is flowing through the artery, its diameter is carefully measured with a mm. gauge. A heavy silk ligature is now passed beneath the artery, and traction is made upon this, pulling the artery out of the wound. A blood-vessel clamp is now applied to the artery in the proximal angle of the wound, and then an artery forceps is applied to the artery in the distal end of the wound; the artery is now severed just proximal to the artery forceps. Immediately the vessel is washed with saline solution, the adventitia is grasped in fine forceps, pulled down, and cut off flush with the vessel end. Next the artery in the grasp of the artery forceps is ligated. While an assistant plays a constant stream of solution on the vessel end, the artery is gently stripped from the clamp at the cut vessel end, thus removing all free blood and clots from the lumen. Three fine sutures, piercing all the arterial coats, are now passed through the arterial end, so that traction upon them will open the vessel end wide. While traction is being made on these guy-ropes, the iridio platinum tube is inserted into the open arterial end and the artery gently ligated to the tube. The same technique is now carried out upon one of the superficial veins of the forearm. The clamp on the vein is removed, then the clamp on the artery is removed, and blood begins to flow.

Blood will flow through iridio platinum tubes indefinitely. Technically, their use is

quite simple. They preserve the full functional diameter of the blood-vessels, hence the time of blood-flow is considerably shortened. They have never failed the author, either experimentally or clinically, in a rather extensive experience.

Clinically direct transfusion of blood is indicated in the following types of cases: Hemorrhagic disease of the new-born; the general class of so-called hemorrhagic diseases, purpura, etc.; in simple blood loss due to stomach ulcer; postpartum bleeding; bladder tumor and trauma; in toxemias of various sorts, either with or without a preliminary bleeding, as uremia, eclampsia, typhoid fever, and pneumonia.

ANASTOMOSIS OF THE VASA EPIDIDYMIS IN STERILITY.

BERNHART (*New York Medical Journal,* Oct. 23, 1915) states that the commonest cause of sterility in men is the occlusion of the lumen of the convoluted tubes of the epididymides. This occlusion, due to bilateral epididymitis, is most frequently found in the head of the epididymis, but it does not, to any material extent, involve the efferent ducts leading from the testicle or the beginning of the vascular cones, the terminal portion of these ducts. An anastomosis then, to be successful, should drain the area lying between the occluded portion of the head of the epididymis and the testicle.

Contrary to common supposition, lack of success in operating is not due to the vas failing to remain patulous, but rather to the fact that the wound in the head of the epididymis has a tendency to close rapidly. The mere insertion of a strand of silkworm-gut or silver wire into the lumen of the vas deferens will not keep open the wound in the gland. This difficulty seems to be readily overcome by the looped wire herein described.

The openings into the vas deferens and head of the epididymis are made as usual. The anastomosing sutures of 00 plain catgut are placed in position, and before being drawn taut the silver wire is in the lumen of the proximal portion of the vas until the loop engages in the wound. The loop is then embedded in the epididymal wound and the sutures are tied. The free end of the wire is brought out of the scrotal wound. The wire is removed in from twenty-four to thirty hours. The wire is bent in such a manner that upon its removal the loop reseparates the adherent wound surfaces in the head of the gland.

The operation should be done under a general anesthetic or by nerve blocking at a distance from the site of the operative field. Local anesthetics, by direct infiltration into the parts, jeopardize operative results because of the distention of the tissues. A close-fitting suspensory bandage is applied immediately after the operation, and the patient is kept in the recumbent position for four to six days.

This technique has proved successful in eight consecutive cases, compared to about thirty per cent of failures otherwise. The wives of four of these patients became pregnant shortly after the operation. In view of the fact that these women had received various gynecological opinions as to the reason for their supposed unfruitfulness and treatment, therefore it might not be amiss to suggest that after a period of barren marriage, if children are desired, the husband be first examined, and then, if necessary, the wife.

PANCREAS STONE COLIC.

EINHORN (*Medical Record,* Oct. 23, 1915) calls attention to the fact that the occurrence of pancreatic stones is rare, whilst recognition of the condition is still rarer during life. He groups the literature as follows: (1) Cases in which pancreatic stones were found at autopsy; (2) cases in which pancreatic stones were found at operation; (3) cases observed clinically, (*a*) without and (*b*) with the presence of undoubted pancreatic stones.

As to diagnosis, he holds that colic-like pains, occurring periodically in the epigastrium, associated with a transient glycosuria, are probably caused by a pancreatic

stone. The sudden disappearance of the symptoms favors the assumption of the passing of the stone. The occurrence of a calculus in the feces, consisting mainly of calcium carbonate and phosphate without cholesterin or bile pigment, points to the pancreatic origin of the stone. At the commencement and for a long time to come the process may not at all interfere with the functions of the pancreas. Only later the presence of a calculus may lead to changes of the pancreatic tissue, which again causes an impairment of the function of this organ. One can see from this what is also clinically confirmed, that a disappearance of the pancreatic function belongs to a later stage of pancreolithiasis and cannot be made use of in any early diagnosis.

The occurrence, however, of sugar in the urine during an attack is of prime importance, although an absence of this symptom would not militate against the diagnosis of pancreatic stone.

As in all other diseases an early diagnosis offers the best opportunity for successful treatment. Just as in gall-stone colic rest during and immediately after the attack is of most importance, the patient is kept in bed, placed upon a light diet, warm applications are made to the abdomen, and if the pains are severe, opium or atropine or both may be given.

Shortly after the attack frequent small meals and the drinking of alkaline waters are indicated. If these measures should not be successful and the attacks become more frequent, or if they become more severe and are attended with a slight rise of temperature, an operation should be advised in order to examine thoroughly the gall-bladder and pancreas. If a stone is found it ought to be removed. If this is not the case—frequently with small stones it is impossible even with the pancreas directly under our fingers to feel them—drainage of the gall-bladder should be done. This must also be done when stones have been found and removed, as one cannot be sure that small stones have not remained hidden. The drainage of the gall-bladder exerts a beneficial effect upon an existing pancreatitis, which we generally find associated with the calculi. Through free drainage the liver and pancreas are eased and the latter organ returns to normal activity.

GUMMATOUS CERVICAL ADENITIS.

COUES (*Boston Medical and Surgical Journal,* Nov. 18, 1915) notes that gummatous cervical adenitis has been thought to be a comparatively rare manifestation of the disease.

The type which offers the greatest interest and difficulty of recognition is that which is the subject of this paper—that is, gummatous cervical adenitis without other obvious signs of syphilis, mistaken in some cases and treated for tuberculous cervical adenitis often over long periods of time without result.

A possible relation between tuberculosis and syphilis is well known to have occupied the attention of many students of both diseases for a considerable time; and we are constantly on the alert in cases of tuberculosis to prove or disprove a previous luetic infection.

In regard to the question of syphilis and tuberculosis, Burzi quotes Nicholas, Favre, and Charlet. In 45 out of 46 cases of syphilis they obtained a positive tuberculin reaction (intradermal), though clinically no symptoms of tuberculosis were found in the patients beforehand. It will be seen that when the results of this examination are at times so equivocal and perplexing, the clinical picture between gumma and tuberculosis may be even more so, and especially where the process is in the cervical lymph glands.

In Fournier's analysis of 3429 cases of various tertiary forms of syphilis there is not a single instance of gummatous cervical adenitis (Wile). He estimated that the total of recorded cases was well under 100.

Up to 1912 only two cases of this condition were reported in the American literature. Most of the cases reported were those occurring at the same time as other tertiary lesions. Wile says that, in his opinion, in the state of our knowledge of the different

granulomata's reaction to mercury and iodide, great caution must be exercised in making a positive diagnosis of syphilis on the clinical signs of improvement, without other data and examinations to judge by. We must bear in mind the opinion of Macleod, and that of Nicholas, Favre, and Charlet, concerning the extreme difficulty and at times the impossibility of distinguishing, microscopically, between syphilis and tuberculosis.

Cases of cervical adenitis supposed to be tuberculous, yet not quite characteristic, should be regarded as possibly gummatous, and careful study with all the means at our command should be made to prove or disprove this supposition definitely. It has been proved that after all the clinician must fall back on consideration of the case with an exhaustive history pertaining to possible syphilis, to arrive at a correct diagnosis.

THE SYPHILIS WE SEE BUT DO NOT RECOGNIZE.

STOLL (*Boston Medical and Surgical Journal*, Oct. 21, 1915) concludes a record of rather suggestive cases as follows:

The late symptoms of lues are often vague, but their indefiniteness should put us on our guard. "Chronic rheumatism" and "chronic headache" mean "chronic syphilis" in many cases. The physician who does not avail himself of all the newer tests before making these diagnoses assumes a grave responsibility. By carefully studying other members of the family some evidence of syphilis may be detected when nothing can be discovered in the patient himself. Of supreme importance is the realization that syphilis is a familial disease. It is a problem for the family doctor, not for the genito-urinary specialist or the dermatologist. Finally, we must not lose all sense of perspective and become blind worshipers at the shrine of Wassermann. Admitting that it is the most valuable laboratory test yet discovered, it is not infallible. Positive in nearly all early cases of syphilis it is often negative in the late cases, especially in adults with a prenatal infection. Even when positive it does not prove absolutely that the lesion in question is due to syphilis.

The Wassermann and luetin tests should supplement, not supplant, the complete history and careful examination.

ENLARGEMENT OF THE THYMUS.

GROSSMAN (*New York Medical Journal*, Nov. 27, 1915) reports a case.

The essential symptom of thymic enlargement is respiratory disturbance resulting from the elimination of space in the superior thoracic strait. This respiratory difficulty may manifest itself in all possible grades, from a mild stridor to a severe dyspnea.

The general appearance of the patient is usually that of perfect health. Some patients have adenoid facies.

The throat, as a rule, is negative, although occasional enlargement of the tonsils may be present.

The enlarged thymus may be felt just above the sternal notch, especially during or immediately after a spasm of coughing. An enlarged spleen and enlarged lymph nodes may be associated phenomena.

An area of thymic dulness may occasionally be mapped out. This area is usually triangular in shape with unequal sides, the base being at the level of the sternoclavicular articulation, the blunt apex above and behind the level of the third rib. The lateral boundaries extend somewhat beyond the sternal lines, usually more to the left, but in the case reported it extended to the right. As a rule there is very little dulness to the right. If the dulness extends more than one centimeter beyond the sternal line it usually denotes enlargement. Hochsinger has percussed an enlarged thymus in twenty-six children, and his diagnoses were subsequently corroborated by the Roentgen ray.

Auscultation may disclose stridor, otherwise it is negative.

The blood usually shows anemia and lymphocytosis.

Any condition which may precipitate an attack of thymic symptoms should be

avoided; for instance, throwing the head far backward, high position of the head, excitement, crying, screaming, running, jumping, very warm or very cold baths, swimming. Where operations are necessary, local and not general anesthetics should be employed.

The general hygienic conditions should be improved. A good, well-regulated diet, quiet life out-of-doors, and equable climate should be recommended. Acute infections of the upper respiratory tract should be treated without delay.

Many operations have been advised and tried. Complete removal of the thymus has always been followed by disastrous results, hence it is no longer recommended. König and many others advise against complete removal of the thymus. He recommends either stitching to the sternum or a resection.

Roentgen irradiation has been employed with favorable results in a number of cases. Flügge, Waters, Rudberg, Aubertin and Bordet, Sinorzersky, Myers, Lange have demonstrated that thymic asthma and marked atrophy of the gland followed roentgenization, together with improvement in the symptoms. Involution begins in from one or two hours after exposure and continues for a variable length of time according to the intensity of irradiation, regenerative changes gradually taking place after treatment has been discontinued.

Irradiation must be employed with caution, as it may inhibit further growth in the tissues (proved by experiments on young animals) and also produce intoxication from the products of lymphoid disintegration.

Thymus feeding has been tried, but without apparent effect upon the affected gland. It seems to have a general tonic action, however. Sabatini reviews some recent researches by Fiore and Franchetti, in which they have apparently demonstrated that it is possible to accelerate the involution of the thymus by injecting serum from adults of the same species. This has been confirmed by their experiments in laboratory animals.

In the absence of any other definite cause for cough in the case reported, the author felt justified in saying that enlargement of the right lobe of the thymus was the underlying factor.

Whether the cough is produced by mechanical pressure of the gland upon any part of the respiratory tract, or whether it is produced by irritation of the recurrent laryngeal or vagus nerves, is a very difficult matter to decide.

PERIPHERAL VASOMOTOR MANIFESTATIONS IN SHOCK.

Muns (*Journal of the Missouri State Medical Association,* November, 1915) regards as inseparable from the subject of blood-pressure in shock the question of the condition of the peripheral and splanchnic arterial circulation. The three great factors in the maintenance and stabilizing of the blood-pressure are (1) the rate and volume of ventricular contraction, (2) the amount of fluid contained in the circulatory system, and (3) the peripheral resistance as represented by the arteries of the peripheral and splanchnic circulations. Concerning the condition in shock of this last factor, much has been said. Many statements have been made by various investigators as to the actual condition of the peripheral vessels after shock has been brought about by intestinal trauma, but, with few exceptions, such changes have not been clearly demonstrated. Some have apparently shown that the vessels in the periphery following long-continued intestinal trauma are dilated, while fully as many maintain that this is not true, but that the whole peripheral system of vessels is contracted.

The author's investigation has for its purpose the demonstration of the actual changes in condition of peripheral circulation following severe manipulations of, and trauma to, the intestines, and the bearing of such changes on the blood-pressure. It is not the purpose of this study to be concerned about the etiologic factors at work in the production of any of the signs or

changes that may be observed, but to record, graphically where possible, some of the actual conditions found after trauma to the intestines, and, if possible, to correlate and harmonize the findings with other proved phenomena. The question of what happens in beginning shock seems to present more opportunities of demonstration that the phenomenon prevailing in well-developed, long-continued shock, because of the danger of mechanical and operative complications in the latter.

It is proposed, therefore, to show: (1) that there are definite changes in the condition of the blood-vessels of the periphery closely following intestinal trauma, the term periphery to mean the whole of the legs, and the body musculature and skin; (2) that these changes can be shown to account for the high or low blood-pressure in cases of shock brought about as above stated.

The method of experimentation consisted in measuring the actual changes in the peripheral vessels. Trauma of the exposed intestines brings about a certain vasomotor response in the blood-vessels of the periphery, and this response is a reflex vasoconstriction. This change in the peripheral vessels begins almost immediately the intestines are disturbed and continues as long as the stimulation is applied.

The effect of intestinal trauma on blood-pressure is determined by the relative degree of constriction or dilatation which exists in the periphery at the inception of the procedure.

The work is summarized as follows:

In every experiment except two there was an immediate change in leg volume.

At the beginning of each experiment there was a period of unstableness of the vasomotor mechanism in the leg without much disturbance in blood-pressure.

These variations in most cases pass away in a few minutes.

In all cases but one there was a fall of leg volume of from 2 Cc. to 10 Cc.

In all cases but two the blood-pressure was maintained throughout the experiment, or at the end was higher than at the beginning.

DIAGNOSIS OF APPENDICITIS IN EARLY TYPHOID FEVER.

WINSLOW (*Annals of Surgery*, November, 1915) reports four cases. In three of them pain appeared to be the symptom which first attracted attention and not fever. There was a moderate leucocytosis in all. In none was the Widal reaction positive; it became so subsequently. In all the cases the appendix was somewhat congested, possibly thickened, but not acutely inflamed, while the large and small intestines were also more hyperemic than normal. The mesenteric and prevertebral chains of lymph nodes were also markedly enlarged in most of the cases.

The author believes that a mistaken diagnosis of appendicitis in early typhoid fever is by no means uncommon; and his purpose in presenting his communication was more for the purpose of eliciting information than for imparting it.

He said that he did not know how to avoid this mistake. He was aware that Dr. Murphy laid down the rule that in appendicitis pain always precedes fever, while in these atypical cases fever always precedes pain. He did not think we should accept this statement axiomatically. In many cases it will be impossible to ascertain whether pain or fever was the initial symptom; and in some cases of typhoid fever pain appears to have been the first symptom to attract the patient's attention. Indeed, Osler says enteric fever may be ushered in with pain in the abdomen, and that "on account of pain in the right iliac fossa, fever, and constipation, the diagnosis of appendicitis has been made, and in two such cases at Johns Hopkins Hospital laparotomy was performed." The author thinks it probable that some lesion of the appendix is present in these cases.

The leucocyte count is probably the most reliable diagnostic sign, and it is usually low in typhoid fever and markedly increased in appendicitis, though at times there may be a low leucocyte count in serious and even fatal appendicitis.

He thinks also there is less muscular rigidity and tenderness in these typhoid

cases than in cases of genuine appendicitis. Headache also is more common. Another possible factor in the diagnosis may be the time of the year at which the cases occur, as three of the four cases here reported occurred in July and August, months in which typhoid is especially prevalent.

In conclusion the writer thought it a very unfortunate occurrence to mistake a case of beginning typhoid fever, with abdominal pain, for appendicitis and to subject such a patient to an abdominal section. This can only be avoided by a careful consideration of the history of the onset of the malady, to ascertain whether fever or pain was the initial symptom; whether the pain was sudden and severe or developed after prodromal symptoms of headache, malaise, and fever. If the abdomen is not markedly rigid, even though pain and tenderness in the right iliac fossa be present, and if the leucocyte count remains low, operation should be deferred until a clear diagnosis is reached.

ANALYSIS OF CASES OF TETANUS TREATED IN HOME MILITARY HOSPITALS.

The *British Medical Journal* of October 23, 1915, analyzes 231 cases of tetanus treated in the home hospitals, of which number 98 recovered and 133 died, giving a mortality of 57.7 per cent, and notes that from over seas it is reported that 179 cases of tetanus have been treated, of which 140 died, a mortality of 78.2 per cent. The death-rate of unoperated cases is stated to be 91 per cent in those of short incubation, fifty per cent in those of delayed incubation. At Netley the mortality stands at 81 per cent, probably due to the fact that the serious cases and those already showing symptoms would naturally be sent there. There were six cases at Aldershot and six recoveries.

In five of these cases a prophylactic dose of serum was given immediately on admission to hospital at Aldershot, and in the curative treatment the direct injection into the spinal canal was always used. In England resort to this preventive use of serum appears to have been rare, and it is suggested that in suspicious cases it seems a sound line of treatment. After onset of symptoms the intrathecal way of approach appears also to be far the most effective.

At Aberdeen there were three cases with three recoveries. None of these had a preventive dose on admission to the Aberdeen Hospital. One had 147,000 units (140,000 subcutaneously, 4000 intravenously, and 3000 intrathecally), another 18,000 units (16,500 subcutaneously and 1500 intrathecally), while the third had only 3000 subcutaneously.

Colchester also had good results—seven cases with five recoveries. Here also there was no prophylactic treatment on admission, and nothing noteworthy in the manner of curative treatment. Most of the cases occurred during September, October, and November, 1914. This may have been due to the fact that the wounded were more exposed to contamination of their wounds at that time, which included the retreat from Mons; that there was less opportunity of receiving surgical treatment as rapidly and as effectually as later on; that during this time the preventive use of antitetanic serum had not been developed, as it has during the last six months, when it is reported that, wherever possible, every wounded man has received a prophylactic dose; and generally that experience has taught medical officers how better to cope with the conditions obtaining in time of war, to unlearn the lessons of modern aseptic surgery, and to revert to the older methods of free incisions, thorough drainage, and constant removal of septic products by baths or irrigation.

At the present time it is impossible to say which of these factors has been the most important. In the cases dealt with, if the symptoms of tetanus appeared within ten days of receiving wound, the mortality was 66.6 per cent; if between the eleventh and twenty-fifth, 39 per cent.

Among the 231 cases, only 37 are noted as having been treated with antitetanic serum before the onset of symptoms: 20 in France, 7 in England, 10 not specified. Of

these 37, 18 recovered and 19 died, giving a mortality of 51.3 per cent.

The usual dose was 1500 units (8 records), but 1000 were given in some cases, 3500 in two, and 4000 in two.

Out of the total of 231 cases the numbers treated with antitetanic serum after the onset of symptoms was 215 (93 per cent). Sixteen cases did not receive curative treatment with antitetanic serum in England. Of these, three recovered and 13 died; mortality, 81.25 per cent. Of the three which recovered, all had been treated prophylactically in France. Of the 13 which died, six had been treated prophylactically in France.

It is generally held at the present time that success in the treatment of tetanus by antitetanic serum depends on the use of big doses.

Out of the 231 cases under review, in 200 only was the amount of serum recorded. In analyzing these 200 cases it must be noted that the amount of serum given is the total amount, not the daily amount or the amount of each dose. For example, if a serious case came into hospital, received 10,000 units, and died at the end of one day's treatment, this would be put down as 10,000, whereas a milder or more chronic case receiving the same treatment for ten days would be returned as having had 100,000 units. It would be false to argue that as the one got ten times as much serum as the other and recovered, the result was due to the larger amount of serum given.

The main conclusion to be drawn from a study of these cases of tetanus treated therapeutically by antitetanic serum is that it seems highly probable that the serum has little or no effect on the course of the disease. There is a little evidence that, if the serum has any effect at all, then the intrathecal method of injection is the most effective. It hence arises that, if serum is to be used at all, then it should first and foremost be injected intrathecally in as large dose as possible, and repeated as often as safe and practicable, as long as symptoms persist. If there is any likelihood that tetanus toxin is still being absorbed into the blood stream from the wound, then, in addition to the intrathecal injection, a further quantity of serum may be introduced intravenously and subcutaneously. In this way 3000 to 5000 units could be injected into the spinal canal and 10,000 to 20,000 into a vein and under the skin.

On account, doubtless, of the ease of giving serum by subcutaneous injection, this method is most used. In 116 cases out of the 215 under consideration (54 per cent) it was the only method employed. In 190 cases (88 per cent) it was one of the methods used. The intrathecal method was only used in 73 cases out of the 215 (33 per cent).

Now the contention is that the intrathecal path should be used in every case in which serum is used, either alone or in conjunction with the other methods.

The treatment of tetanus by carbolic acid injections was described by Baccelli in 1888, and consists of the subcutaneous or intramuscular injection of carbolic acid. It is generally used in a 1-in-20 solution, and from 3 to 12 grains of the acid constitute a daily dose.

In the present series 33 cases were treated by this drug; 12 patients recovered and 21 died (63.6 per cent).

From a study of the table it would appear that there is no evidence that carbolic acid has any favorable therapeutic effect on cases of tetanus. It is also suggested that small doses, such as half a grain a day, are quite inadequate.

The injection of a solution of magnesium sulphate seems to have been first used in America, and its value depends on its powerful sedative or anesthetic action on the spinal cord. Few of the cases under observation in England have received this treatment. One case was given 2 Cc. of a 25-per-cent solution intrathecally; another, one injection (amount and strength not given) subcutaneously; another received 2 Cc. of a 25-per-cent solution with each dose of serum intrathecally. Three doses were given, and the patient recovered. Two cases received intrathecal injections, one of them 7 Cc. of a 25-per-cent solution. In other

cases it was given by the mouth and by the rectum, but in these it could not have been intended to exert its action on the spinal cord. Nine cases in all were treated with magnesium sulphate; of these seven died and two recovered.

It would appear that this method of treatment is powerful and not without danger, so that great caution ought to be used in its exhibition. Stromeyer treated five cases, giving an injection of 8 Cc. of a 15-per-cent solution. In two of these there was marked anesthesia of the trunk and lower extremities; in the other three no anesthesia was noted. In all five cases after the injection there was a cessation of the spasms and muscular rigidity, the patient slept, and respiration was slowed.

In the 231 cases of tetanus under review the mortality was 57.7 per cent.

Cases with a short incubation were more fatal than those of longer incubation.

Most cases occurred on the tenth day after the wound.

There are few allusions to the use of antitetanic serum as a prophylactic.

In regard to the therapeutic effect of antitetanic serum, the evidence would go to show that this action is not well marked.

If antitetanic serum is used—and in such a fatal disease it would seem wrong not to give the patient the benefit, even if doubtful, of the antitoxin—it ought to be injected in the first place intrathecally, as this method would seem to possess advantages over the intravenous and subcutaneous methods.

There is no evidence that any benefit accrued to the cases treated by carbolic acid or magnesium sulphate injections.

To sum up, the treatment of a case of tetanus might be as follows:

Place in a quiet, darkened room under care of a sympathetic and capable nurse.

The best surgical treatment of the wound should be thoroughly carried out to insure the prompt and complete removal of all septic products.

The intrathecal injection of at least 3000 units of antitetanic serum. At the same time 10,000 to 20,000 units may be injected intravenously and subcutaneously. This procedure to be repeated as frequently as the course of the disease seems to demand.

In addition to this the patient should receive sedative drugs, such as chloral or chloretone, in full doses.

A NEW OPERATION FOR THE RELIEF OF PRURITUS ANI.

Back (*Practitioner,* November, 1915) describes a modification of Sir Charles Ball's method; the latter consists of making two crescentic incisions round the anus enclosing the entire ellipse, with the exception of a narrow neck in front and behind. The flaps of skin so marked out are raised, and carefully dissected up as far as the mucocutaneous junction. The flaps are replaced and retained by sutures. The whole idea of the operation is to cut the superficial sensory nerves supplying the part, and so to render the area anesthetic.

Now it can be demonstrated beyond contradiction that the superficial nerves are cut. If, therefore, the hypothesis that the pruritus is due to an abnormal condition of these superficial nerves is correct, the percentage of cures should be higher.

Back therefore began to make a systematic examination of the cases after this operation by testing the sensibility of the area inside the incisions (1) to a light touch with cotton-wool (epicrisic), and (2) to a pin-prick (protopathic). The results were so anomalous that he began to doubt the correctness of the superficial nerve theory.

Of the first 20 cases he thus examined, 12 were cured. None of the dozen, tested two months after the operation, had any perceptible diminution of perianal sensation, protopathic or epicrisic. Of the remaining eight, who were unrelieved, two after the same interval of time had complete perianal anesthesia. Back noticed one other curious thing. In spite of the greatest care taken in tying vessels during the performance of Sir Charles Ball's operation, a hematoma, of greater or less degree, does fairly often supervene. In all the 12 cases of cure, some degree of hematoma had been observed, but in only two of the eight unsuccessful cases.

Now the anal region is supplied with blood by the inferior hemorrhoidal artery, and the tone of this artery—*i.e.*, its condition of constriction or dilatation—is controlled by the small branches from the sympathetic system which travel with it. It occurred to Back that if he wilfully cut and ligatured the artery, he should, at the same time, divide the nerve which controlled it, and thus relieve the vasomotor incoördination of the part.

He, therefore, makes the same incision on each side of the anus, as in Sir Charles Ball's operation, but instead of dissecting up a flap he cuts frankly down into the tissue of the ischiorectal fossa, until he meets and divides the inferior hemorrhoidal artery. The artery is small and cannot be dissected out, but it is easy to cut across it, and its spouting ends are then readily recognized and ligatured.

GUNSHOT WOUNDS OF THE HEAD.

Several papers in the *British Medical Journal* of October 2, 1915, suggest editorial comments as follows:

Dr. Gordon Holmes and Mr. Percy Sargent draw attention to a new type of vascular lesion in the brain, a type brought into prominence by the large number of glancing or shallowly penetrating wounds about the vertex of the skull that have to be dealt with. These injuries result in thrombosis of the superior longitudinal sinus and of its associated lateral venous lacunæ and the superior cerebral veins connected with them; in addition, there may be gross injuries of the adjoining cerebral tissue.

Naturally the symptoms and signs vary much with the location and severity of the injury received. Their outstanding features, however, consist in the unusual distribution and type of the palsy induced, in the muscular rigidity always associated with it, in the curious disturbances of sensation observed, and in the relatively slight extent to which the sphincters are involved. As regards the paralyses noted, it was found that out of 78 patients 20 had all four limbs involved, 31 had both legs and one arm affected, 16 had only the legs paralyzed; in 6 the signs were mainly hemiplegic; and in 5 one leg alone was touched. The hands were less severely affected than the arms, while the feet were more paralyzed than the legs—a most unusual feature when comparison is made with the cerebral palsies commonly met with in civil practice. As the authors point out, this curious distribution finds its natural explanation in the anatomical disposal of the motor centers for these distant parts of the body in the cortex of the brain. The muscular rigidity of the paretic limbs is described as very striking; it occurs early, is generally coextensive with the paralysis, and usually diminishes in proportion as the power of spontaneous movement returns. Even the muscles of the trunk may be involved, so that the abdomen is rigid and the respiratory movements become feeble. In certain instances reflex spasms have been associated with the rigidity, and in ten patients fits were observed, unilateral in eight instances; the reflexes are increased, and Babinski's sign is present. The sensory changes found are said to be those of pure cortical lesions unaccompanied by any shock effect, as, indeed, is the case with the motor symptoms.

The clinical picture is so novel that the authors hasten to christen it with the title of the "Longitudinal sinus syndrome." It is satisfactory to learn that most of their patients recovered. It is too early yet to give figures that can be regarded as final; only one patient died out of thirty-seven that were not operated upon, while out of thirty-nine on whom operative procedures were taken fifteen died, seven of the fifteen having also some direct injury of the brain.

The authors remark on the difficulty of deciding upon the line of treatment that should be adopted in these cases of injury to the superior longitudinal sinus; they characterize the results of surgical interference as extremely unsatisfactory, and emphasize the tendency of cases uncomplicated by laceration of the brain to improve spontaneously. Yet in many cases operation is indicated for fear of septic infection and other complications, as is set out by Captain

Roberts, who gives figures proving the remarkable success attending the treatment of soiled and septic scalp wounds on the lines indicated by common sense and the requirements of aseptic surgery. Captain Roberts urges once more, as so many have done before him, that gunshot wounds of the scalp should not be probed. The probe is a deadly weapon here, as it may readily convey a superficial infection into the depths of the wound. He recommends excision of the scalp wound, and of the injured bone beneath it if need be; if the dura mater is uninjured the operation wound is sutured and closed without drainage. He reports that out of 118 cases in which this primary suture without drainage was practiced, 114 healed by primary union, and only one broke down altogether. Like Captain Tabuteau, he recommends that all foreign bodies within reach of the exploring finger should be removed from the brain when that has been penetrated.

Captain Tabuteau, on the strength of an experience based upon 95 cases, puts forward a plea for the most thorough surgical examination of every case of gunshot wound of the head, no matter how trivial the injury may be at first sight. The wound should be excised, and the underlying tissues submitted to the most careful scrutiny. A comparatively small wound in the scalp may overlie extensive fractures of the skull and severe lacerations of the brain, a condition of affairs that calls for immediate and thorough surgical investigation. In other instances the contrary is the case, and an apparently severe scalp wound may be associated with no intracranial damage whatever. When it is found that the dura mater has been torn, a digital exploration of the lesion or track in the substance of the brain should be made. Naturally, much help may be gained here by use of the *x*-rays, when penetrating fragments of metal or bone will be brought into view. Like Captain Roberts, he recommends the administration of urotropin (1 or 2 drachms a day) to patients in whom a fracture of the skull is even suspected. It would be interesting to know how far such internal medication is actually capable of preventing or cutting short intracranial sepsis. The amount of the drug or of its products of decomposition that reaches the cerebrospinal fluid must be almost infinitesimal.

CONCLUSIONS REGARDING THE LIMITATIONS OF LOCAL ANESTHETICS IN ANORECTAL SURGERY.

GANT (*West Virginia Medical Journal*, October, 1915) observes that when operating upon rectal, urinary, and other affections at the pelvic outlet it is necessary to choose between regional and local anesthesia. In the former the anesthetizing fluid is deposited in the cord or an individual nerve, with the object of desensitizing the parts supplied by the nerve and its branches, while in the latter the lesion operated upon is infiltrated and anesthetized by injecting the solution directly into it without attempting to reach any particular nerve. The author states that he wastes no time in searching for nerves, because he knows that when enough water or eucaine is deposited to cause blanching of the tissues he can operate without discomfort or pain. The desensitizing action of the anesthetic in local and regional anesthesia is due to nerve blocking produced by pressure of the fluid upon the nerves or chemical action of the solution upon the nerve equipment, or both.

In so far as operations about the rectum and anus are concerned, the ether spray, ethyl chloride, liquid air, and agents which deaden pain by benumbing or freezing the parts are of little use because they are not always effective, induce severe initial and postoperative pain, are unsuitable for extensive operations, and are often followed by extensive sloughing.

Cataphoresis, as suggested by Wagner (1886) and perfected by Morton (1891), is not a desirable means of producing anesthesia because it is unreliable, requires considerable preparation, an extensive electrical equipment, and a much longer time to anesthetize the parts than the infiltration method.

Solutions of eucaine, cocaine, stovaine,

novocaine, etc., alone or in combination, have been employed more or less frequently for producing local and regional anesthesia, and their popularity has been largely due to the writings and teachings of Corning, Schleich, Oberst, Reclus, Demont, the writer, and others.

After experimenting extensively during a number of years with the above-mentioned chemicals, sterile water, quinine and urea hydrochlorate (½-per-cent solution), he has come to the conclusion that the most reliable agents to employ in operations about the anus and rectum are a ⅛-per-cent eucaine solution and sterile water or a normal salt solution. Formerly the author employed eucaine, cocaine, novocaine, stovaine, etc., much stronger than now, but increased experience has demonstrated that any operation suitable for local anesthesia can be painlessly performed with ⅛-per-cent eucaine solution.

The author's experience with eucaine anesthesia has been universally satisfactory in over 4000 operations, and he prefers it because it can be sterilized, does not irritate, and has invariably produced complete anesthesia and caused less toxic manifestations than cocaine, stovaine, novocaine, and like agents used in equal strength and quantity. In fact, when eucaine is employed in a ⅛-per-cent solution in anorectal operations, the patient rarely complains of pain, dizziness, turns pale, becomes excited, or faints during or following operations owing to the non-toxic action of the drug, slight amount of eucaine required, and escape of the solution during and immediately following the operation.

While experimenting with drugs he observed that they invariably produced complete anesthesia of the infiltrated part when retained, and that when the solution escaped through a fissure, ulcer, or fistulous opening the anesthesia was incomplete. This fact suggested the idea that all or part of the desensitizing action of the water or solution was due to its pressure exerted upon the local nerves or their terminals. To determine if this was so experiments were begun in September, 1901, with sterile water, normal saline solution, compressed air, oil, and other media which could be injected into and made to distend the tissues. The results, in nearly every instance, showed that the injection of sterile water or a normal salt solution would produce complete anesthesia and enabled him to perform operations about the anorectal region which were heretofore performed under general narcosis. These experiments further demonstrated that neither the temperature of the water nor chemical employed were entirely responsible for the desensitizing action of the injected fluid. He was able to perform many successful operations with water or the solutions at varying temperatures, but observed that less discomfort followed when the agent was introduced at the bodily temperature. It was also observed that when enough fluid had been deposited in the tissues to cause them to become glassy white, anesthesia was complete, and that when the operation was begun before such blanching was obtained, cutting caused sharp pain, irrespective of the temperature or composition of the fluid injected.

He has painlessly operated for the relief of internal, protruding and bleeding hemorrhoids, external, cutaneous and thrombotic hemorrhoids, uncomplicated complete, blind internal and external fistulæ, foreign bodies, simple prolapsus ani, fissures, anal papillæ, cryptitis, ulcers, polypi near the anus, incision of ischiorectal, submucous, marginal and follicular abscesses, hypertrophied rectal valves, stricture within the anal canal, some congenital malformations of the anus and rectum, sacral dermoids, cysts, condylomata and lipomata of the lower rectum and buttocks, incipient and developed epitheliomata, perianal cysts, foreign bodies located beneath the skin or mucosa, division or divulsion of sphincter for constipation, fecal impaction or sphincteralgia. He has also performed colostomy, appendicostomy, colopexy, cecostomy, and celiotomy under local anesthesia to relieve intestinal obstruction, constipation, chronic invagination for exploratory purposes, and to improve the condition of patients suffering from rectal

procidentia and the various types of ulcerative colitis causing chronic diarrhea.

Grant regards as not suitable for local anesthesia all rectal malignant and benign growths, extensive procidentia recti (involving all bowel coats), pelvic and large perirectal and ischiorectal abscesses, deep, boring fistulæ and polypi when large, numerous, and high up.

The administration of a general anesthetic is also imperative for most surgical operations performed for the relief of lesions situated in the upper rectum and for extirpation and resection of the bowel, incision of the coccyx, removal of tumors, operations upon strictures located above the peritoneal attachment, necrosis of the coccyx or sacrum, congenital malformation of the rectum above the internal sphincter, and other affections of the anorectal region, necessitating an extensive or an unknown amount of cutting.

General anesthesia is also indicated in operations for abscess, fistula, fissure, hemorrhoids or other anorectal disease which interferes with the anesthetizing process, exposure of the lesion, or prevents a thorough operation.

Again, infiltration anesthesia is not effective when the areolar tissue is loose and permits the water or eucainized solution to disseminate before it has had an opportunity to sufficiently compress or otherwise act upon the nerves to produce a satisfactory anesthesia, and where the secretion leaks through an ulcer, fissure, or fistulous opening before desensitization of the part is obtained.

Gant observes that much unnecessary postoperative pain follows the employment of large rubber tubes wrapped with gauze, supposedly introduced for the purpose of allowing flatus to escape, while in reality they are pressure plugs, used because the operator fears postoperative hemorrhage. After a large personal experience with the rectal tube he wishes to say that it is unnecessary, causes great pain while in place, and hurts terribly when removed later after the granulations have become enmeshed in the gauze. Hence he never employs a tube, gauze plug or pledget in fissure, hemorrhoidal, or other rectal operations, except for drainage purposes or to temporarily arrest or prevent bleeding.

In conclusion he states that his experience with sterile water and eucaine anesthesia in coloproctology during the past fifteen years has been extensive and so very gratifying that he does not hesitate to recommend infiltration anesthesia in preference to general narcosis in the majority of minor and many of the more extensive operations which the modern proctologist is called upon to perform.

WOUND INFECTIONS AND THEIR TREATMENT.

WRIGHT (*Lancet*, Nov. 6, 1915), as the result of his experimental and clinical studies, states that he can put what he has to say in a very few words. He has not himself come across—and he has permission of all his fellow-workers to say that they also have not come across—any satisfactory clinical or bacteriological evidence of the utility of antiseptics as employed in infected wounds. In connection with this, he states that working as they have been for the last year in the largest base hospital in Boulogne, they must have watched and examined bacteriologically very many thousands of wounds—to say nothing of their having conducted the bacteriological examinations in no less than four long series of clinical experiments undertaken to put to the test the confident prognostications of reputable promoters of this or that antiseptic. The opinion he has just expressed—*i.e.*, the opinion that, judged by its clinical results, the antiseptic treatment of infected wounds is of quite doubtful utility—is that which is held by the very large majority of those who have had prolonged practical experience in this war.

Contrary opinions have been expressed; these should be very largely discounted. For the most part they are opinions expressed by persons possessing a very limited experience and unfamiliar with the course the wound follows when left to itself.

Credit may have been given to the antiseptic, where it ought really to have been given either to the menstruum in which it was applied or to incidental circumstances attendant upon the treatment. Thus, for instance, continuous irrigation practiced with antiseptic solutions would effectively wash out the wound and keep it constantly moist; a hypertonic menstruum used as an excipient for the antiseptic would act as a lymphagogue; peroxide of hydrogen would effectively assist in the evacuation of the pus; carbolic acid or other antiseptic used in the form of hot fomentations would bring heat and moisture to bear; and no doubt many different varieties of antiseptic would induce temporary hyperemia. He thought it would be seen that favorable results occasionally manifesting themselves after antiseptic treatment might quite well be interpreted in the sense here suggested.

So far has been considered in connection with the clinical data only the question whether the antiseptic has had any beneficent effect in the wound. Let us now turn the leaf, and see whether there are entries also on the debit side; and let us here consider the effects produced in the wound itself, dealing afterward with those produced on the healthy skin in its neighborhood. In connection with this he first emphasizes the fact that disastrous results —he was thinking more particularly of the development of gaseous gangrene—supervene when antiseptics made up in viscid or semisolid excipients are introduced into the wound. For this result the excipient which confines the discharges and imprisons the infection would seem to be primarily responsible.

It is, however, not only antiseptics in unsuitable menstrua which arrest the outflow of lymph and imprison the infection. With perhaps the exception of carbolic acid employed in concentrated form, all antiseptics in their degree, and strong antiseptics in particular, would seem, by coagulating the albuminous substances on the surface of the wound, to exert this prejudicial effect.

Coming now to the application of antiseptics to the skin surface in the neighborhood of the wound, we have, of course, here a procedure which has exactly the same aims as the preparation of the skin for operation, except only that it is here foreseen that the wound will remain open.

The usual procedure for the sterilization of the skin in field ambulances is to paint strong iodine all round the wound, and then—plant for sterilizing dressings not being available so far to the front—to cover in the wound with cyanide gauze. This in many cases is followed by results like those which used to be obtained when carbolic fomentations were used as a prelude in surgical operations. There is produced—and this applies quite generally in connection with every application which "irritates the skin"—first, reddening of the epidermis; then effusion and blistering; and then there develops in the blisters a luxuriant growth of serophytic microbes. In other words, by our misdirected energy we cultivate at the very doors of our wound, upon the very area of skin which we intended to keep from microbes, a copious harvest of streptococci and staphylococci.

One word about a kind of antiseptic which concentrates its chemical energy upon the microbe, instead of, like the ordinary antiseptic, expending it wastefully upon the albuminous substances in which the microbe may be embedded. Those who have followed the development of "chemotherapy" will immediately perceive that the author refers to salvarsan and ethylhydrocuprein hydrochlorate (now known as optochin), and will appreciate that, if these chemical agents can be shown to exert a powerful bactericidal effect upon pyogenic organism, they might perhaps usefully be applied both directly in the wound and also by the channel of the blood, reaching in these ways all the microbes in the body with the exception only of those embedded in dead spaces and infiltrated tissues. Captain S. R. Douglas and Lieutenant A. C. Inman, working the one with salvarsan and neosalvarsan, and the other with optochin, have found that these kill the streptococcus in serum, and that optochin in particular kills

the streptococcus in serum in very high dilutions.

A long series of surgical procedures all having reference to the treatment of wound infections might quite properly come up for consideration here if this were a treatise instead of an introductory lecture. The author runs over the list, indicating in connection with each the place that it would take in the treatment of the wound infections. We have, first, the opening up of the wound, and the incision of the tissues undertaken to get drainage for imprisoned infections; secondly, the washing out of the wound and the irrigation of the walls with therapeutic fluids; thirdly, the immobilization of the limb for the avoidance of autoinoculations; fourthly, the ablation of the heavily infected and infiltrated walls and floor of the wound; and fifthly, the secondary suturing of the wound for restricting the area of exposed and infected surface, and closing the wound when the infection has been overcome.

The customary procedure in connection with wounds is to remove only those portions which are sloughing; and to amputate, where a limb is involved, only that portion which is deprived of its blood-supply, or quite hopelessly infected. To Colonel H. M. W. Gray is due the credit of pointing out, and enforcing by a long series of cases successfully treated under his supervision in the military hospitals at Rouen, that it is possible in suitable cases to abort wound infections by the excision of the infiltrated wall and floor, the operation being completed by sewing up the wound immediately, or after treatment with hypertonic salt solution. The kind of cases which Colonel Gray selected for treatment by excision are scalp wounds and what we might call "gouged out" and "punched in" wounds of soft tissues.

The theoretical considerations which commend the procedure of Colonel Gray are that it removes heavily infected portions of tissue which, though they could be brought back to a healthy condition, are for the moment incapable of contending successfully with infection. And, above all, the method holds out a prospect of immediate victory over the infection; and, of course, practically immediate convalescence.

That a deep wound when once infected must be allowed to granulate up from the bottom, and that a surface wound must be allowed to close by the growing in of skin from the sides, are maxims which would be in their proper place in a system of surgery which aimed at doing all it could to delay healing and keep the patient in hospital for the longest possible time.

On the other hand, it might quite well be imprudent to embark deliberately upon a policy of sewing up microbes in wounds to accelerate healing.

Let us place before ourselves first these facts. An infection of subcutaneous tissues is always of more serious import than a mere surface infection. There will always be something unfavorable either in the general condition or in the histological conditions when microbes succeed in maintaining themselves in the tissues. Here at least the leucocytes and the blood fluids ought to be able to hold their own. Exactly the contrary holds true of surface infections. On denuded surfaces, no matter how healthy the condition, the microbes, though they may sometimes have to struggle, will always find means to maintain themselves. As long as the floor and walls of the wound are still indurated we can be sure that we are still dealing with an imprisoned infection. On the other hand, when we have lying naked before us in the wound a system of lymph spaces communicating freely with one another, filled in with clear fluid, and fed from full capillaries, we then know that we have got rid of the imprisoned infection, and that if any infection still lingers it is a purely surface infection.

Wright asks whether the antiseptics ordinarily used may not be serviceable because of the stimulating effect rather than because of any antibactericidal influence, and suggests the word phylacagogic agents or such applications as bring the protective elements of the body—*i.e.*, the blood fluids and leucocytes—into application with the wound. In this present contribution he confines him-

self to the study of strong and weak salt solutions. We have in these phylacagogic agents—in hypertonic saline solution a lymphagogic and in physiological saline solution a leucocytagogic agent.

Hypertonic salt solutions exert three kinds of effects: a physical effect, a physiological effect, and an effect on the condition of the wound and the bacterial infection.

REVIEWS.

OBSTETRICS. A Practical Text-book for Students and Practitioners. By Edwin Bradford Cragin, A.B., A.M., M.D., Assisted by George H. Ryder, A.B., M.D. Illustrated. Lea & Febiger, Philadelphia, 1916.

This is a book of nearly nine hundred pages, illustrated with 499 engravings and 13 plates, and has been prepared by a teacher and practitioner of obstetrics who is widely and favorably known amongst medical men in this country and abroad for the sane views which he holds in regard to this important department of medical practice. The book is not quite as large as some of the other modern text-books on obstetrics, and is correspondingly advantageous since it is not necessary to read a great volume of text to obtain the practical points which are immediately desired. On the other hand, he who studies the volume will find that it is sufficiently complete to give him all the knowledge which he should possess as a scientific and practical obstetrician.

The book is divided into six parts. The first part deals with the Anatomy of the Female Genital Organs and Embryology; the second part with Physiological Pregnancy and its Management—in this division there are nine chapters; part three considers Pathological Pregnancy; part four, Pathological Labor; part five, Obstetrical Surgery; and part six, the Pathological Puerperium.

It will be seen at once that this is a most satisfactory clinical division of the text, since the reader who seeks definite information along any particular line which is of intense interest at the moment can readily find from the table of contents in the index the facts which he desires.

In the treatment of the toxemia of pregnancy, which is a condition of interest to the general practitioner, who does little actual obstetrics but who is liable to be called upon to take care of such a case until an obstetrician can be obtained, we are interested to find that the author holds to the view that the condition should be looked upon as a toxemia associated with faulty proteid metabolism with a tendency to pathological lesions in the liver and kidneys, especially in the former.

Concerning the diet, if any food can be retained by the stomach, he states that meat should be avoided. Milk, either plain or diluted, or special preparations of milk and cereals, may be administered. If it be true that proteid metabolism is faulty we question whether the free use of milk is wise, but the generous employment of cereals is undoubtedly so. We think that the author is in error, however, in stating that the patient's nutrition must be maintained if possible by the employment of nutritive enemata, as, for example, peptonized milk. All recent researches show pretty clearly that little or no support, from a nutritional standpoint, is obtained by this means. Probably it would be wiser to use levulose, which seems to be absorbed as proteids are not. If the author's views concerning the use of sodium bicarbonate, to correct acidosis, are correct, then the free use of carbohydrates by the mouth or of levulose by the rectum is not only dietetic but medicinal in effect.

Of all the remedial measures known to the author, he states that that which has served him best has been colon irrigation with soda solution, once or twice daily, thereby emptying the bowel and furnishing food and alkalies to the system. We are sorry that he does not give definite directions as to the strength of the soda solution.

If it is above nine-tenths of one per cent it will cause the passage of fluid from the tissues into the bowel, but little or no soda will be absorbed. In the operation of emptying the uterus he strongly recommends ether instead of chloroform, since the latter drug is known to exercise a destructive influence upon the liver cells.

Another piece of excellent advice is that it is not sufficient for the pregnant woman to send specimens of her urine to the obstetrician every two weeks. She should be seen by him personally in order that her blood-pressure may be taken and that she may be examined for the presence of edema, headaches, disturbance of vision and digestion.

Dr. Cragin does not believe that chloroform is useful to control convulsions, but is harmful for reasons already given. It is interesting in this connection to note that he only had 71 cases of eclampsia in 8000 deliveries, which, being treated without chloroform, gave a mortality of eight deaths (11.2 per cent), whereas in 251 cases of eclampsia in 20,000 deliveries prior to the abandonment of chloroform there were 71 deaths, a mortality of 28 per cent.

Concerning chloral hydrate, the author thinks that we may feel justified in continuing its use in eclampsia, because in reasonable doses it is not likely to do harm to either the liver or the kidneys.

Dr. Cragin's work is essentially that of a practical clinician, and for this reason is certain to prove popular and useful.

PRINCIPLES AND PRACTICE OF MEDICINE. By Arthur R. Edwards, A.M., M.D. Third Edition, Thoroughly Revised and Rewritten. Illustrated. Lea & Febiger, 1916.

This exhaustive text-book of over a thousand pages, including its index, is a well-planned attempt to cover an enormous subject within the space of one volume, and, being prepared by one who is constantly engaged in teaching this department of medicine in a large medical school, it represents the needs of the student and the practitioner.

We are somewhat surprised to find that the author states that the pulse-rate of pneumonia is 100 to 120. Usually, we believe, the latter rate is a sign of very grave danger, and in ordinary cases a pulse-rate of 90 to 100 certainly is much more common. When this comparatively slow rate is compared to respiratory rate it gives us a diagnostic point in examining a patient who is thought to be suffering from this disease. We are glad to see that the author emphasizes the need of fresh air in its treatment, and that he insists upon the patient remaining absolutely quiet and not attempting to sit up.

We note with interest that he considers strychnine is the best vasomotor tonic, but we differ from him absolutely in his statement that this drug should be given in every case lest vasomotor paralysis and collapse develop without warning. We believe strychnine should be kept in reserve to meet these complications when they arise, and that to use it constantly destroys its efficiency when it is badly needed. So, too, we think the dogmatic statement that strophanthin should not be used if digitalis has been administered as it may cause sudden death does not really represent the facts as they exist, although it may have a modicum of truth in it. Nor do we think that the statement that heart stimulants must always be used with venesection is entirely correct. Finally, the dogmatic statement that the iodides are indicated in delayed resolution seems to us to require evidence in its support or some degree of modification.

It is very easy in reviewing a book of this kind to become a carping critic and still more easy to find fault with therapeutic recommendations which the author may, from time to time, see fit to make. The reader of such a review ought always to bear in mind that an author who gives his personal views is giving what the reader really wants, and not merely a summarization of what is generally given in other books. Dr. Edwards's work has a distinctly personal atmosphere. He states what he thinks and what he believes to be true as the result of his experience.

The illustrations are some of them rather

antique, as, for example, figures 30 and 31, and also 33, 34, 35. On the other hand, those illustrations which are more modern are well executed and reliable.

The volume will prove a useful guide not only to Dr. Edwards's own students, but to many practitioners, who will find in it a large amount of valuable information which represents a thorough knowledge of the subject derived from medical literature and personal experience.

THE TREATMENT OF ACUTE INFECTIOUS DISEASES. By Frank Sherman Meara, M.D., Ph.D. The Macmillan Company, New York, 1916.

This book is exactly what its title indicates, being a consideration of the therapy, medicinal and otherwise, of the various infectious diseases which affect man. Altogether the list of diseases numbers thirty-five. There is a preliminary chapter upon Febrile Conditions in General and another upon Diet in Acute Infectious Diseases, and after these the various maladies of an infectious nature are considered, being taken up chiefly in their order of importance, beginning with Acute Rheumatic Fever and ending with Septicemia and Erysipelas.

As Dr. Meara has been actively engaged in teaching therapeutics in the Cornell Medical School for some years, and as he is one of the attending physicians at the Bellevue Hospital, he has had sufficient experience to make whatever he states along these lines of interest and importance.

We are glad to note that he is in favor of feeding fevers, rather than starving them, particularly in the case of typhoid fever. In the treatment of acute rheumatic fever he insists upon the necessity of administering large doses of the salicylates, and he very properly emphasizes the need of giving bicarbonate of soda with the salicylates. He also seems to consider that sodium salicylate is the most efficient preparation. Aspirin is also referred to in terms of approval. His advice that the severe pain of acute articular rheumatism had better be controlled with morphine rather than large doses of the coal-tar products is also wise.

It has been our experience that lanolin is a better ointment base with ichthyol for the inflamed joints than petrolatum, as the latter tends to prevent the absorption of any drug. These statements in regard to advice which the author gives in the treatment of rheumatism are indicative of the methods which he follows throughout the rest of the volume.

The use of the personal pronoun is constantly resorted to, and this gives the book an individuality which many volumes lack. So, too, at the close of each chapter there is given a brief summary of the treatment of the disease and for the treatment of its complications, which, after all, is another form of a therapeutic index. Little or no attempt is made to quote other writers. The text is an expression of the author's individual views. They are sane and safe and worthy of confidence.

PELLAGRA. A Modern Problem. By George M. Niles, M.D. Second Edition, Illustrated. W. B. Saunders Company, Philadelphia, 1915. Price $3.00.

In the three and a half years which have elapsed since the publication of the first edition, this book has shown itself to be sufficiently important and interesting to have exhausted the original copies and a reprinting. In the present edition many changes and additions have been made in an endeavor to bring the text up to our present state of knowledge. The investigations of Goldberger and of the Thompson-McFadden Pellagra Commission are given careful consideration, and, in the chapters on treatment, the most recent views are discussed, from the use of scarlet red ointment for obstinate dermatitis to the consideration of emetine for amebic infections of the mouth and intestines.

The author admits that the causation of pellagra is not as yet definitely settled. The volume contains ten chapters, a bibliographical index, and an ordinary index. It is printed with such wide leading and such good-sized type that it is unnecessarily bulky, but also, for this reason, easy to read. A number of illustrations showing typical cases are included.

Those practitioners who live in the pella-

gra zone will find much of great interest and value in Dr. Niles's contribution, and those who do not live in this zone but who may be misled by sporadic cases, if they are not on the lookout for them, should possess and read it in order that a correct diagnosis may be made and proper measures instituted when sporadic cases are met with.

A Text-book upon the Pathogenic Bacteria and Protozoa. For Students of Medicine. By Joseph McFarland, M.D., Sc.D. Eighth Edition, Revised. Copiously Illustrated in Black and White and in Colors. W. B. Saunders Company, Philadelphia, 1916. Cloth $4.00.

That a book dealing with so highly technical a subject as this should have reached eight editions in twenty years is not only a tribute to its excellence, but is also a tribute to the profession in general who have recognized the great importance of a knowledge of the topics with which it deals. Dr. McFarland has the happy faculty of expressing himself clearly, both by word of mouth and with his pen, and, because of these facts and his familiarity with the subject, a number of the editions have been reprinted so as to meet the demands of the market. Altogether the book covers more than eight hundred pages.

It will provide the general practitioner with all the knowledge that he needs upon the subject with which it deals, and it will provide the laboratory worker with the technique which will enable him to become a useful and skilful scientific investigator. The author not only gives the methods which he has found useful, but quotes freely from general literature on the subject, giving references so that those who are interested in any particular line of work can follow it still further.

Nitro by Hypo. A Pep-tonized Tonic for the Physician. By Edwin P. Haworth. The Willows Magazine Company, Kansas City, 1916.

Under this extraordinary title the author tells us in his preface that so many words of commendation have come from the recipients of "The Willows Magazine" that he has deemed it advisable to gather together some of the choice inspirational articles and paragraphs from his files and to print them in book form. The author points out that the medical journals are usually filled with articles of scientific significance and all too little space is devoted to methods, business, inspiration, uplift, and he hopes that the volume will cheer the depressed and dispirited practitioner so that he will better fulfil his mission.

Various divisions, or chapters, of the book deal with such subjects as Service and Remuneration, Personality in Medicine, The Reading Habit, Religion and Medicine, Your Medical Library, Hardships and Ease, etc.

This book may be said to be in medical literature what Elbert Hubbard's "Philistine" was to the laity, dealing lightly and in an interesting way with various themes which more or less directly interest all medical men, and doctors in particular.

Painless Childbirth and Nitrous Oxide-Oxygen Analgesia. By Carl Henry Davis, M.D. Forbes & Company, Chicago, 1916. Price $1.00.

The great interest which has been manifested by the profession and laity in the subject of "twilight sleep" is apparently the stimulus of the author of this volume. We are a little in doubt as to the exact intent of the writer in inditing his pages, for some of the technical terms, and the journals quoted, would seem to indicate that the volume is meant for medical men, whereas some of the rest of the text, as, for example, the definitions which open the book, are apparently meant for the laity.

The book is dedicated "with tender memories to my mother and her patience in suffering."

The statement is made that the publishers will be pleased to supply an electrotype or photograph of the author upon request.

It goes without saying from the title of the volume that Dr. Davis is a believer in the relief of the pains of parturition by the means of nitrous oxide-oxygen rather than by the employment of hypodermic injections of morphine and scopolamine.

The publishers state in their prospectus that the author has been able to show that maternity is more dangerous to-day than

before the discovery of anesthetics and antiseptics, which would seem to indicate that any form of anesthesia is unwise.

INSTINCT AND INTELLECT. By N. C. MacNamara, F.R.C.S. Oxford University Press, New York, 1915.

In a small book of a little over two hundred pages the author starts out with the proposition that "educationists," to use his phrase, at the present time appear to exaggerate the importance of training the intellect and are apt to overlook the fact that each individual possesses certain instinctive qualities which, to a large extent, determine his behavior throughout life. These qualities which no human power can eradicate may, however, be favorably modified by appropriate training. In his text the author endeavors to give an outline of the evidence and the reasons upon which he relies to prove that the instinctive behavior of human beings depends on work performed by different parts of the brain.

There are seven chapters and an appendix. The first deals with Molecules and Atoms and with the Unicellular Organisms; the second with Multicellular Organisms; the third with the Nervous System of the Star-Fish; the fourth with the Nervous System of Higher Forms of Fish; the fifth with Conditions in the Mammalia; the sixth with the Brain of Man in his Various Types of Non-development and Full-development; and the last chapter deals with the Cerebral Cortex and the various changes or abnormalities of this part of the nervous system which are met with in certain individuals.

HYSTERIA AND ACCIDENT COMPENSATION. By Francis X. Dercum, M.D., Ph.D. The George T. Bisel Company, Philadelphia, 1916.

This small volume of a little over one hundred pages deals with the nature of hysteria and the lesson of the post-litigation results. The author has endeavored to present the subject of hysteria in as condensed and readable a form as possible. As the book is intended for legal rather than medical readers technicalities have been avoided as largely as possible, and a glossary of the terms which it is essential to employ is appended. There is also a list of thirty-eight important contributions to hysteria and kindred affections at the close of the volume.

Dr. Dercum has had a very large experience as a neurologist and an equal experience as a neurological expert in medicolegal matters; he, therefore, knows the needs of the legal profession and has been able to present an adequate summarization of this subject, which is particularly timely in view of the wide-spread application of the Workman's Compensation Act and the question of compensation for accidents and injuries on the part of travelers and others who may suffer injury at the hand of individuals or corporations.

A PRACTICAL TREATISE ON INFANT FEEDING AND ALLIED TOPICS. For Physicians and Students. By Harry Lowenburg, A.M., M.D. Freely Illustrated. F. A. Davis Company, Philadelphia, 1916. Price $3.00.

As Dr. Lowenburg throughout his medical career has devoted himself largely to the feeding and care of infants, he brings to the preparation of this book the result of considerable study and experience. The colored plates are remarkably good. Those showing the normal stool in an artificially fed baby and the stool of the child suffering from indigestion are particularly excellent, as is also that of the so-called green or spinach stool of infants. The book does not profess to be a scientific discourse upon disorders of nutrition in children, but a description of the variations from the normal which will be found by the general practitioner in his daily route. It can be recommended to those of the profession who desire a handy little volume to which they can frequently turn for useful information.

A REFERENCE HANDBOOK OF THE MEDICAL SCIENCES. By Various Writers. Third Edition, Completely Revised and Rewritten. Edited by Thomas Lathrop Stedman, A.M., M.D. Complete in Eight Volumes. Volume Six, Illustrated. William Wood & Company, New York, 1916. Price $7.00 cloth, $8.00 leather, $9.00 half morocco.

It is some time since volume five of this very excellent encyclopedia or handbook appeared. The fact that two large editions

have been published prior to this one has made the book familiar to many members of the medical profession. The present volume has many articles of great value, and the authors are, in nearly every instance, men of repute. The text extends from Lig to Oza, starting out with Ligation of Arteries and ending with Ozæna.

It is impossible to review a volume written by a great number of authors and covering nearly a thousand pages in which the entire range of scientific and practical medicine and allied science is considered. The book is of great value and a credit to the publishers and the profession. We hope that the other volumes can be completed before the first part of the series becomes too old.

INJURIES OF THE EYES, NOSE, THROAT AND EARS. By Andrew Maitland Ramsay, M.D., F.R.F.P.S. (Glasgow); J. Dundas Grant, M.D., F.R.C.S. (Eng.); H. Lawson Whale, M.D. (Camb.), F.R.C.S. (Eng.); and Charles Ernest West, F.R.C.S. (Eng.). Oxford University Press. Henry Frowde, London, 1915. Price $1.00.

This further contribution to the War Series begins with Injuries of the Eyes, in which Ramsay states the war injuries exhibited three chief complications—sepsis, tetanus, and sympathetic ophthalmia. The brief summarization of both emergency and subsequent treatment is as profitable for the general practitioner as for the military surgeon.

The section on Nose and Throat is contributed by Grant and Whale. There seems little in this contribution of special value to the military surgeon. Rather does it deal with the general principles of injuries involving these parts. There are appended to this section brief notes of some 38 cases. Concerning injuries to the ear, it is stated that rupture of the tympanic membrane is a not very uncommon war injury. The treatment advised is wiping out the external meatus and laying in a clean dusting powder and plugging with gauze. Thereafter the ear is let alone. Concerning deafness, it is considered to be remarkable with what completeness the possession of an antecedent middle-ear deafness seems to screen the ear from damage by explosion. The deafness due to rupture of the membrane and swelling of the tympanic mucosa is often very great and accompanied by pulsating, buzzing noises. The prognosis, however, is generally good. The distinction between destructive deafness and that of labyrinthine type depends upon the tuning-fork.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

In the hospitals we still have the same run of cases. A few frost-bites, nearly all of which occur amongst the blue-fingered type of soldier, a certain number of cases of shell shock, and some cases of rheumatism and so forth. The frost-bites vary in intensity, but are much milder than last year, and it is not at all common to see cases in which gangrene has set in. The milder cases only require about a fortnight in bed, and are then able to get about, but it is wise to take every precaution against the incidence of flatfoot in these cases. They are therefore massaged, and not allowed to stand on their feet too long for a further period of a fortnight. There are also a few cases of paratyphoid which have evidently escaped detection in France. These are remarkably mild, and the great difficulty is to make the individuals realize that it is necessary for them to lie in bed and to limit their dietary. There is an epidemic of measles and German measles in the country, which is producing a certain amount of illness amongst the troops in training. The civil population has naturally been affected also, and measles is now a notifiable disease. The Metropolitan Asylums Board do not take in cases of measles as a rule, but are making an exception in the case of the military, and are

preparing to receive soldiers notified as cases of measles, and to treat them at the ordinary fever hospitals.

The organization of the medical profession is proceeding. The Central Medical War Committee are endeavoring to find out the greatest number of medical men below the age of forty-five who can be spared from their private, public, and hospital duties. The committee are in close touch with the Director-General of the Army Medical Service, with the Insurance Commission, with the Local Government Board, and with the Board of Education. The difficulty in connection with the hospitals is that all the recently qualified men immediately take commissions. A few of them are seconded for a period of three months or so to posts of house surgeon or house physician. These residents therefore form a reserve, from which men are to be called up in case of an emergency. Should such occur, the hospitals would be left without any qualified residents, and in some cases it is anticipated that the younger members of the staff will take the place of the residents thus called out. This will be preferable to allowing senior, but unqualified, students to take the posts vacated.

Much good work is being done under the auspices and guidance of the Medical Research Committee. It will be remembered that this committee was formed in connection with the National Insurance Act, and from the funds of this body it receives a capitation grant. Prior to the war, the Mount Vernon Tuberculosis Hospital, which had been closed, largely on account of lack of funds, had been acquired for the purposes of the Medical Research Committee, and it was proposed to institute a large research into the question of tuberculosis at this institution. With the onset of the war, these plans were considerably altered, and the hospital itself was placed under the War Office, as a hospital for the wounded. The proposed research into tuberculosis was for the moment abandoned. The Medical Research Committee, however, has not abandoned its activities, but has inaugurated a number of schemes of research in connection with the war. Amongst these are to be reckoned a Bureau, now being established, to collect and collate the sickness statistics from the various fields of activities. This will be a very big business, for it is quite certain that a lot of sorting out of material will be necessary, owing to the hurried manner in which cases have to be evacuated, so that the valuable and reliable histories and medical sheets will be collected and retained. It is also proposed to produce a History of the War in its Medical Aspects. Many other researches have been started, amongst the most successful of which, that dealing with fatigue and industrial work, may be considered of value. Amongst the purely medical investigations those connected with nephritis, trench frost-bites, and soldiers' hearts are at the present time being carried out in various institutions. For this purpose such cases, when diagnosed in France, are sent over here to those institutions in which such work is being undertaken, and are thus brought near to the laboratories instead of being scattered in a haphazard fashion over the country generally. A large part of the functions of the committee are expended in providing skilled investigators to assist those appointed to take up any particular branch of investigation. It will thus be seen that the work of this committee is spread over a number of different objects, and as far as I know it is the first really combined attempt toward the organization of research, and government support of such an organization, in this country.

I have in previous letters referred to the employment of women in posts previously held by the men. With the calling out of the Derby recruits a far larger proportion of women will naturally be employed than formerly. Committees are being formed in country districts to go round and organize female labor to assist various industries, amongst which the farming industry is to be reckoned one of the most important. The difficulty in the country districts lies in the fact that a woman cannot readily leave her house each day, but it seems quite

feasible for her to leave her house every other day, so that with a small amount of arrangement it will be possible to supply one unit of labor from every two women in the villages. The country laborer is proverbially slow at his work. A very good instance of this was brought home to me the other day, when I met a friend who supervises a farm of 500 acres, on which prior to the war eight men were employed. Five of these have joined the army since the war began. He now pays each of the remaining three a wage and a half, and finds that the work is done practically as well as before. He does not anticipate in the future employing as many men as previously. Among other occupations taken over by women, that of the van-driver with a horse or motor commands attention. There are now almost as many vans driven by women as by men, especially in those businesses where the packages to be delivered are not of great weight. I have also seen two women ticket-collectors on busses, one of whom was dressed in a resplendent khaki uniform. The post of laboratory assistant and medium making can also be carried on easily by women, and the old saying that women could cook anything except a bacterial medium has already been falsified. An attempt was also made by some firms of window-cleaners to employ women instead of men. This apparently was not successful.

NOTES AND QUERIES.

THE HARRISON LAW.

HEMENWAY in the *Bulletin of the Chicago Medical Society* of February 12, 1916, makes the following report:

In order to understand such a document as the so-called Harrison law, it is necessary to remember that as yet the United States does not have full sovereignty over its territory. By the ninth and tenth amendments all power not distinctly given to the Congress is reserved to the individual States, or to the people. What is ordinarily called "police power" is therefore reserved to the States, and in so far as the National Government desires to exert police power it must do so indirectly.

Recognizing the harmful effects of the opium trade, in 1909 in a council of representatives of the principal nations at Shanghai, the United States set on foot concerted international efforts to restrict this trade in opium and its products. In the furtherance of this object Congress has passed certain laws.

Heavy duties and restrictions upon importation tend to make it an object for certain people to import contrary to law; and to prevent this smuggling a law was passed which makes punishable the receiving, storing, or secreting opium imported contrary to law. It was claimed by the offenders that the United States had no jurisdiction in the matter. That after the opium was once in the State, and thus mixed with the merchandise of the State, it was only within the police power of the State, except in so far as it might be subject to national tax. The United States Circuit Court of Appeals held that under the power to regulate interstate and foreign commerce, the United States has power to make the receiving, concealing, buying, or selling of such opium punishable, and upheld conviction under the statute. (Steinfeldt *v.* U. S., 219 Fed., 879; also U. S. *v.* Caminata, 194 Fed., 903; Jung Quey *v.* U. S., 222 Fed., 766.)

The statute of February 9, 1909, prohibited the importation of opium after April 1, 1909, except under certain conditions. Opium found in the possession of any one when unlawfully imported was subject to seizure, and the burden of proof was upon the holder to show lawful ownership. By a subsequent statute it was provided that all opium found after July 1, 1913, should be presumed to have been imported after the said first day of April, 1909, "and the burden of proof shall be on the claimant or the accused to rebut such presumption." An

aged Chinaman was found with 2¾ pounds of smoking opium in his possession. He testified that he bought the opium on the street in Butte, Montana, and paid $100 therefor. He was therefore tried and found guilty of receiving opium imported contrary to law. He asked for a new trial, on the ground that he was deprived of liberty and property without due process of law. The United States District Court, however, denied the petition and upheld the conviction. In the course of the decision the court said:

"The court takes judicial notice that opium is not commercially a domestic product. Perverted to evil uses, it is in general an outlaw. Its presence in this country, apart from statutes, is practically a conclusive presumption of importation. Presence and possession in the accused invoke the statutory presumption that he imported it, or received it after importation. And since its importation is unlawful these six years, in view of its nature, the statutory presumption that it was imported within the said period and to the knowledge of any one receiving it is not unreasonable, to the extent hereinbefore indicated." (United States *v.* Yee Fing, 222 Fed., 154.)

The holder must be prepared to show lawful ownership.

The gist of these decisions is that goods imported contrary to law are not properly a part of the merchandise of the country so long as they may be traced; but it may readily be seen that by a frequent change of ownership and storage this difficulty of tracing would be very great. Consequently, the so-called Harrison Antinarcotic Act was passed by Congress in this suppression of smuggling. Though the incidental effect of the law may be an aid to those who are endeavoring to check drug habits, and although the law has been seriously misused by both honest and dishonest upholders of its provisions, the purpose of the law is to aid in the collection of the government tax upon imported products.

This aid is in two ways: First, all persons, with slight exceptions, who keep, sell, prescribe, or dispense opium or its products, or cocaine and similar habit-producing drugs, are required to pay a special tax, and receive a special license annually. This enables the officers of the government to enroll lawful handlers of the drug, and concentrate their attention upon certain members of the community; and if others be found with the goods in their possession the presumption is that they have them unlawfully.

Secondly, all persons receiving the license are required to schedule at certain dates all such drugs in their possession, and the transfer of such articles is regulated by the requirement of such records that the goods may be traced from place to place. If an unlicensed person be found with the drug in his possession it is presumptive evidence of guilt; and if a licensed person be found with more of the drugs in his possession than accounted for, it is presumptive evidence that he is using the drugs unlawfully.

The purpose of this drug act is expressed in its title: "An Act to provide for the registration of, with collectors of internal revenue, and to impose a special tax upon, all persons who produce, import, manufacture, compound, deal in, dispense, sell, distribute, or give away opium or coca leaves, their salts, derivatives, or preparations, and for other purposes."

In U. S. *v.* Jin Fuey Moy, 225 Fed., 1003, Judge Thompson, of the Western District of Pennsylvania, said: "This is a revenue act; unless it is such, save as to those provisions which relate to the transportation of the drugs in interstate commerce, it would perhaps violate the provisions of the Constitution of the United States." In U. S. *v.* Woods, 224 Fed., 278, Judge Bourquin, of Montana, based his whole argument upon the Act as a revenue act. It does not attempt to regulate the practice of medicine. It simply provides certain requirements which must be observed by physicians when they prescribe or administer these habit-forming drugs. The law does not say that a physician shall not administer or prescribe morphine to a morphine eater, nor does it put a limit upon his prescription.

In U. S. *v.* Friedman, 224 Fed., 267, the

defendant had been indicted for a supposed violation of the Harrison Act. The claim was "that he distributed, dispensed and prescribed the aforesaid drugs in quantities more than was necessary to meet the immediate demands of a patient, and did not distribute, dispense and prescribe the drugs in good faith and as a medicine." The indictment was quashed by the United States District Court for Western Tennessee, the court saying: "I fail to find in the Act of Congress under examination any language making the doing of the things with which the defendant is charged a violation of law."

It will be noticed that the Act calls for the registration of those who manufacture, import, sell, or prescribe, or give the drugs in question, but nothing is said of those who consume them. It is a rule of the courts that a statute must be construed as a whole, and giving the entire statute, if possible, a constitutional interpretation. This act makes the doing of certain things, or the failure to do certain other things, punishable. The courts therefore construe the law more strictly.

An opium smoker was arrested for failure to register and to pay the tax. It was admitted that the defendant was found with opium on hand, and the government did not attempt to claim that defendant either sold or gave away the drug. She was indicted. The U. S. District Court, Montana, dismissed the indictments, and discharged the defendant. The indictment was based on section 8, "all persons," but the court said that "taxes can be imposed and statutory offenses created only by direct, clear and apt language." The list of those to whom the law should apply is in section 1, and consumers are not there mentioned. (U. S. *v.* Woods, 224 Fed., 278.) The District Court of Western Tennessee and that of Western Pennsylvania also held that the possession of opium or its products, by one not registered and licensed, was not unlawful under this act, so long as the drugs were for personal use. (U. S. *v.* Wilson, 225 Fed., 82; U. S. *v.* Jin Fuey Moy, 225 Fed., 1003.)

Either directly or indirectly those who are bringing cases to the attention of the officers have been basing prosecutions against physicians upon the supposed fact that unregistered users are violators of the law. The attempt has been made to indict physicians for having conspired to aid drug habitués to violate this section 8. So far the decisions published have been unanimous against this claim. (U. S. *v.* Jin Fuey Moy, 225 Fed., 1003.)

A physician wishing to prescribe or dispense morphine or cocaine must annually pay to the Collector of Internal Revenue the sum of one dollar. He must make an application for a license upon a prescribed form, with an affidavit showing that he is entitled to receive the license. He must also purchase from the Department blank orders to be used in buying these specified drugs. He should hang his license where it may be seen in his office. To purchase the drug, the physician must make out an order in duplicate, properly signed and dated, and he must preserve his duplicate for two years.

Physicians dispensing these drugs must keep a record of all such drugs dispensed or prescribed, and the date. (By a ruling of the Department where minute quantities are used, as in a spray, the physician is permitted to record when the spray was made, and how much of the drug was thus used, and when that lot was exhausted.)

When physicians write a prescription for any of these drugs mentioned in this act, the name and residence of the patient and date should be given. A record is not required by law to be kept of such prescriptions by physicians, but the druggist must not honor such prescriptions issued by those who do not hold the special Harrison Act license, and when the prescription is honored the druggist must preserve it for two years. A physician is not required to make a record of drugs actually administered while making calls. It is better, however, to make such record, and to preserve carbon copies of all prescriptions calling for opium or cocaine or their derivatives. It is a reasonable ruling, though not within the pro-

visions of the law, which requires physicians in writing prescriptions for these drugs to append thereto their personal registration number. This is the number written on the license, not that stamped thereon. This number is an evidence to the druggist that the physician holds such a license, and it enables the officers to detect violators.

A prescription may be considered as an "order," and with that interpretation it is necessary that the copy of the prescription calling for opium, etc., must be preserved for two years. This was the interpretation put upon the act by the District Court of Northern Ohio. (U. S. *v.* Charter, 227 Fed., 331.) "He rightfully construes the provisions quoted as providing that physician is excused from failing to keep on file for inspection a duplicate of an order given by him to the patient only when he keeps a record of his own dispensing, which record may be inspected as provided in the act." The physician was held because he neither preserved a duplicate of the order nor made a record of dispensing.

A physician's prescription calling for opiates must contain the name and residence of the physician. It should be signed by his "full name," but that expression is taken to mean such a signature as he would use for a bank check.

Though by special exception in section 6 the Harrison law does not apply to the sale, etc., of remedies containing less than two grains of opium, or a quarter of a grain of morphine, etc., per fluidounce, this exception is taken to mean proprietary or standard preparations. The exception does not apply to physicians' prescriptions calling for any quantity of morphine, unless that morphine be contained in some standard preparation.

The representatives of the Internal Revenue office and the Assistant District Attorney in charge of the work assure us that no reputable physician need fear prosecution so long as he observes the law as written. The physician would be given the benefit of every doubt. It is the desire of the department to check the operation of quacks and habit-producers. In this desire the members of the Chicago Medical Society will be found in hearty sympathy. However, we are convinced that the officers in the Internal Revenue Department are attempting to exceed their authority, and in so doing they are dependent solely upon their own arbitrary standards. If it be not illegal for drug users to have personal supplies on hand without license, there can be no "conspiracy to commit a crime" in giving to such habitué a prescription calling for morphine. A prosecution depending upon the whim of the officer may be the means of doing almost irreparable harm to the reputation of a physician.

The direct restriction of the drug habit, being a function of the State under its police power, should be attained through State enactment. In the enforcement of the State law the operation of the Harrison Act will be an aid. Also the State law will often enable the national officers to trace illegal drugs. Neither representatives of the Internal Revenue office, nor of that of the Department of Justice, mentioned a single reported case contrary to those herein cited, though the direct question was asked them. The most that they could say was that they hoped to get these decisions set aside by the higher courts. The unanimity of decisions from all sections of the country, as well as the known principles of constitutional law, indicate that the present decisions will be sustained. The law is constitutional as it stands, being for the purpose of enabling the government agents to trace illegal drugs. The attempt to apply it in limiting the treatment of cases by physicians is a clear violation of constitutional principles.